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DEPARTMENT OF DEFENSE

SUPPLY MANAGEMENT REVIEW PROGRAM

PLANNING REPORT

OCTOBER 1965

**OFFICE OF THE ASSISTANT SECRETARY OF DEFENSE
(INSTALLATIONS AND LOGISTICS)**

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FOREWORD

This report was written by a working group formed at the request of the Assistant Secretary of Defense (Installations and Logistics). Our assignment was to develop organizational and operating plans for a Supply Management Review Program which the Assistant Secretary had directed be established.

Because of the complexity and scope of the defense supply management field, it was apparent that any attempt to comprehensively survey all supply management functions and subfunctions and to compile and analyze extensive statistics would not be practical and would delay establishment of the review program. We therefore chose to develop proposed plans for the Supply Management Review Program based primarily on our own experience and judgment, augmented by information and advice obtained from visits to headquarters organizations and some inventory control points, reports of review agencies, and discussions with other specialists in defense supply management.

Our extensive use in this report, notably in Attachment F, of information obtained from Military Service and DSA personnel, particularly with respect to inventory control point policies and practices, should be put in clear perspective at the outset. All Services and DSA were represented on the working group, and the ICP visits were undertaken simply to add to our prior knowledge. Our sources of information varied greatly, from official manuals and directives to completely informal remarks by officials and supply specialists at widely ranging working levels. Because of the nature of some of our sources of information, two points should be stressed:

(1) the ICP policies and practices we refer to are not offered as necessarily being representative of the policies and practices throughout the parent agencies; (2) nor is the purpose to be critical of any individual inventory control point or supply management system. Rather, this information is presented to emphasize the many common but substantial DoD-wide supply management problems which might be alleviated by better DoD policy guidance.

During the course of visits to ICPs, the working group probed many areas in which potential problem areas might exist. Some of these areas are not reflected in this report. This is due to several things: some of the areas probed resulted in problems of a minor nature; some had no significant commonality; and some did not relate to improvement of DoD-wide policies, a working group criterion.

We wish to express our sincere appreciation to personnel of the Military Departments and the Defense Supply Agency who took time from their normal work to help us carry out this project.

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SUMMARY

This summary presents briefly, without detailing the full rationale offered in the following report, the findings and recommendations of a Supply Management Review Program working group whose assigned tasks were to recommend major supply management areas for review, provide review guidance, and develop appropriate organizational arrangements.

Selected review areas

The working group concentrated on the area of supply requirements, because of the obvious support and cost implications. Most of the problem areas dealt with in this report involve requirement input factors, supply levels, or other functions within the requirement computation process. Two problems concern broader supply management matters and are considered fundamental to any orderly supply management improvement program

The first of these, "Categorization of Items for Management Purposes," deals with establishing the key pattern of item groupings to which differing supply management methods and degrees of intensity are applied. The lack of consistency among the ICPs within the Department of Defense in item management categorization impedes DoD-wide application of improved supply management policies and procedures, and the accumulation of DoD-wide supply management summary statistics meaningful to management and review levels. This report recommends that review and policy development in this area be given first attention.

The other basic problem area is "Supply Effectiveness Measurement and Analysis." Lack of common concepts, rules and measurement techniques among the DoD components prevents DoD-wide evaluation of supply performance against common objectives and supply support costs. Review and policy development work in this area is recommended either after the item categorization problem is resolved or earlier if manpower permits.

Other problem areas, presented in detail in Attachment F, are:

- ICP asset knowledge and control
- Use rate factors and demand forecasting
- Procurement lead time factors
- Input factors peculiar to reparable item requirements
(repair cycle time, repair rate and attrition rate)
- Operating levels
- Safety levels
- Procurement lead time levels
- Repair cycle levels
- Additive stock levels procured in provisioning
- Criteria for migrating provisioned item assets to
demand management
- Selection of items for mobilization reserves
- Mobilization requirement factors and computation techniques
- Application of other than war reserve stocks in the
computation of mobilization reserve materiel requirements
- Basis for decisions regarding prepositioned mobilization
reserve materiel requirements
- Balancing and protecting mobilization reserve stocks

Review of computed requirements

Budgetary requirements

This report recommends concurrent attack on several of these problems because of their importance and the promise of early payoff.

Review guidance

This report finds a most influential factor to be the absence or vagueness of DoD-wide policy in most of the functional areas considered. The development of DoD-wide supply management guidance is considered of paramount importance. This report recommends that each of the reviews deal with a functional topic, such as those mentioned in the preceding paragraphs, in order to achieve the focus and depth needed to develop policy solutions. Each review should involve concurrent review efforts in all of the DoD components to which the review topic is applicable, first to insure that policy statements developed and recommended have DoD-wide application and, second, to have maximum opportunity to take advantage of progress made by the individual agencies. The recommendations concerning review guidance contain additional details regarding the nature and content of such guidance, and the required collaboration between OASD(I&L) and participating organizations in preparing this material.

Organization and staffing

A primary aim of this study was to devise an arrangement which would accomplish the objectives of the program with minimum duplication of existing review organizations and review impact on operating activities. A good deal of weight was given to the size

and complexity of the supply management review and policy development task, which would represent an immeasurably large workload for a small size staff.

This report considers and dismisses alternatives in favor of an arrangement which would employ:

a. A new six-man staff within the OASD(I&L) Supply Management Policy Directorate to manage the Supply Management Review Program. This would include selection of problem areas and their priorities, development of long range review plans, development of review objectives and guidance, and development and publication of policy.

b. A portion of the existing internal audit staff throughout the Department of Defense to carry most of the review workload, under the direction and coordination of OASD(Comptroller). OASD(Comptroller) functions, carried out in collaboration with OASD(I&L), would include allocation of audit effort, preparation of detailed audit guidance, evaluation of audit results and policy recommendations where appropriate.

c. Points of contact within the Military Departments and DSA to deal with OASD(I&L) on Supply Management Review Program matters including participation in reviews, on a selected case basis, by Departmental and Agency supply management personnel.

A proposed DoD Directive implementing the foregoing is included in this report as Attachment G.

SECTION I. BACKGROUND

In December 1964 a report entitled "Defense Procurement Management Small Purchase Review," prepared by the Procurement Management Review staff of the Office of the Assistant Secretary of Defense (Installations and Logistics), recommended that OASD(I&L) establish a Supply Management Review Program along the lines of the Procurement Management Review Program. ASD(I&L) approved the report and, on February 6, 1965, signed a memorandum (Attachment A) to the Military Departments and the Defense Supply Agency stating that he had decided to establish such a program. The Military Departments and DSA were each requested to nominate one individual for membership in a working group to be headed by an OASD(I&L) representative. The task of the working group was "to develop organizational and operating plans and an itinerary for initial reviews."

The working group met for the first time on March 29, 1965. The four Military Services and DSA were represented (the names of the working group members are listed in Attachment B). In the next two weeks, the working group developed more definite ideas about the review program and about the way it should carry out its assignment. As a result of these first efforts, a memorandum to the Military Departments and DSA was prepared giving additional information about the program and the working group's task. ASD(I&L) signed that memorandum on April 15, 1965 (Attachment C). Key points made about the Supply Management Review Program were that the "program is intended to provide this office and echelons of management within the departments and

agencies (a) advice concerning the relative importance of existing supply problems, and (b) recommendations with respect to the relative priorities for their solution through a centrally organized development effort."

The program was visualized as having three key characteristics: "a DoD-wide perspective, a careful selectivity in the supply management areas to be reviewed, and a pronounced emphasis on policy improvements."

In defining more specifically the working group's task, the April 15 memorandum stated that the group was to:

"1. Select supply management areas of major interest from the standpoint of military readiness and economy, for the purpose of future emphasis in supply management reviews.

"2. Develop a standard guide which cites the areas to be covered by supply management reviews and which directs the conduct of the reviews; and undertake pilot reviews to the extent necessary to determine the adequacy of the review guidance.

"3. Develop a DoD Directive which will formally establish the Supply Management Review Program, cite its purpose and scope, prescribe organizational arrangements and relationships, and set forth the responsibilities of the Office of the Secretary of Defense, the Military Departments and the Defense Supply Agency."

The working group was given a completion date of October 29, 1965.

In its first weeks, the working group met with OASD(I&L) officials, others in OSD, and with Bureau of the Budget analysts. Our principal purpose was to get their views on major supply management problem areas, and their opinions on how the Supply Management Review Program should function.

In late April and early May, we met with representatives of the Military Services' and DSA's headquarters staffs (Attachment D). They gave us information about their approaches to supply management and supply management reviews, and offered comments on this new program. Many of the viewpoints of the various individuals and organizations we contacted are taken into account in the following portions of this report.

Also in early May, the working group developed plans for orientation trips to selected inventory control points. The purpose of these trips was to obtain relatively detailed information on supply management concepts, policies and procedures, and to develop a better understanding concerning problem areas. In recognition of the wide range of supply management functions and the great amount of time which would be required to cover the entire field, the working group confined its more detailed inquiry to the requirements areas provisioning, replenishment, mobilization, and special program requirements. We knew that within these subjects are many problem areas important from the standpoints of supply support and economy. We also visualized that, after the Supply Management Review Program is established, other review areas could be added reflecting more current subject matter priorities and manpower. Questionnaires in each of these requirement areas were developed for the use of the working group members in obtaining comparable information from different ICPs. Attachment E lists the ICPs visited by the working group and includes examples of the guidance provided them in advance of the visits to

insure uniformity of coverage and the availability of individuals qualified to discuss the subject matter.

A special point was made to give ample coverage to internal audit operations in the field of supply management. (The reasons for the particular interest in this area are discussed in detail in Section II C.) In mid-July one member of the working group assumed responsibility for covering this subject on a full-time basis. Several meetings of audit program personnel and Supply Management Review Program working group members were held to examine possible relationships and working arrangements between the two programs.

SECTION II. VIEWS AND RECOMMENDATIONS

The discussion and recommendations in this section of the report are tied directly to the three tasks (quoted earlier and paraphrased below) assigned the working group by the April 15 memorandum:

1. Select supply management areas of major interest.
2. Develop guidance for supply management reviews.
3. Present a blueprint for the Supply Management Review Program organization and staffing.

Before dealing with these three topics, we want to offer some preliminary comments on three related matters that have greatly influenced our ideas about the Supply Management Review Program: weaknesses in DoD guidance; independently developed, differing Service/Agency policies; and a so-called "proliferation problem."

First, there is a great assortment of supply management problems which have been known about and talked about for years - but which scarcely have been addressed by DoD-wide policy guidance. Examples could be cited at great length; to name just a few:

- Use of recurring and nonrecurring demand data.
- Techniques for forecasting demand.
- "Push" versus "pull" systems of activity and replenishment.
- Rules for stockage/nonstockage of items at individual locations.
- Policies for insurance item distribution.

- Criteria for managing items as reparable versus nonreparable.
- Frequency of asset reports and scope of asset knowledge.
- Basis for establishing safety levels.
- Concepts and methods for measuring supply effectiveness.

There appear to have been a number of reasons for the limited amount of DoD-wide guidance in these and many other areas. Perhaps the foremost reason is the small size of the OSD staff which deals with these and a host of other matters in the supply management policy field. Another influence has been a viewpoint held by some that OSD supply management policymakers should provide "broad policy" and "keep out of operations." With the more recent advent of centralized actions to create standardized, procedural systems such as MILSTRIP, there has been increasing recognition of the effectiveness of such uniform techniques.

Second, in the absence of comprehensive and specific DoD-wide supply management policy guidance, the Military Services and DSA have developed their own policies and procedures rather independently. While some voluntary collaboration and consultation take place among the Service/Agency staffs, policies and procedures differ considerably from one Service or Agency to the next. Some would justify these differences by the differences in organization and missions of the Services and DSA. Further, some contend that independence and competition in the creation of supply management policies and procedures stimulate initiative and produce the most effective management rules.

There are, however, obvious penalties in the individual Service/Agency policy and procedure development:

- Repetitive Service/Agency actions in interpreting/implementing nonspecific DoD-wide guidance.
- Redundant investment of Service/Agency manpower to design commonly needed policies and procedures in the absence of DoD-wide guidance.
- Some fostering of a "not invented here" attitude, thereby inhibiting use of more advanced techniques developed by others.
- Some difficulties in interservice communication concerning innovations, due to organizational separation of the Service/Agency policy and procedure designers in the different agencies.
- Use of unique Service/Agency terms and definitions, adding to difficulty in communicating and understanding.
- Resultant multiplication of the number of policies and procedures in existence to cover the given number of common supply management functions, thereby multiplying the difficulty in comprehending, evaluating and upgrading existing systems DoD-wide.
- Resultant criticism, particularly by OSD and BoB representatives during budget reviews, of individual Service/Agency supply management policies which have been created in the absence of DoD-wide guidance.

Counter to the viewpoint favoring independent Service/Agency policy and procedure development, it can be noted that, despite differences in organizations and missions, the Services have tremendous commonality in the range of supply functions they must carry out, the types of supply policies and procedures they require, and the supply management problems

they must face and attempt to solve. Out of a much greater number of examples, common tasks/problems for most DoD ICPs are those cited previously and others, such as:

- Computation of budget requirements.
- Provisioning buy decisions.
- Supply levels and techniques for their establishment.
- Policies for replenishment stockage.
- Rules for redistribution versus buy.
- Criteria for economic retention.

The penalties of individual Service/Agency actions discussed earlier would be largely avoided by the development of more uniform and more specific supply management policies applicable DoD-wide. The latter is an objective reflected in the words of the Assistant Secretary of Defense in the April 15 memorandum: "I look to the Supply Management Review Program for an appraisal of problems in the supply management policy area and to serve as an important input source for more uniform DoD-wide supply policy in the major problem areas."

Third, in the course of the working group's meetings with Service and DSA personnel, there was one complaint voiced consistently and strongly. We have come to call it the "proliferation problem." It was said that too many individuals and offices launch programs and projects independently, each intended to improve some function or process, each with deadlines and a sense of high priority, most without sufficient regard to resources to do the job, and many without

sufficient coordination . . . with the result that varying degrees of overlap and, in some cases, contradictions are built in. The finger was pointed at OSD offices in this complaint, but it was granted that the agencies below OSD contribute to the proliferation problem by a similar approach to agency-initiated programs and projects which was weak in planning and scheduling to insure coordinated effort. We believe that much of what is written in the preceding paragraphs clearly and directly relates to the proliferation problem. With DoD-wide guidance frequently either very general or absent for many of the specific supply management functions, and with the Services and DSA fairly independently creating needed specific policies and procedures, it is exceedingly difficult to synchronize new improvement actions with the constantly changing, diverse Service/Agency supply management systems. Aside from such faults as insufficient planning and inadequate coordination among staff offices, which may have contributed to the proliferation problem, clearly the past Service/Agency approach in independently creating needed supply policies, procedures, ADP systems and techniques, etc., has created a complex DoD-wide supply management environment in which proliferation is difficult to avoid. Conversely, if the Services and DSA were all "singing from the same sheet of music" wherever uniformity is feasible, proliferation would be easier to control. In addition, as policy and procedural improvements are conceived anywhere in the Department of Defense, their assimilation on a relatively concurrent basis by all concerned would be simplified.

The three related matters just discussed: weaknesses in DoD guidance; independently developed, differing Service/Agency policies; and the "proliferation problem" were of sufficient importance to have an effect upon the approach to and accomplishment of the three principal tasks assigned the working group. These tasks - selecting supply management areas of major interest, developing guidance for supply management reviews, and presenting a blueprint for the Supply Management Review Program organization and staffing - are addressed in the following subsections.

A. Supply Management Areas of Major Interest

The working group has identified and described a number of significant supply management problem areas. These are presented in Attachment F. The selection of these areas was based on the knowledge of the members of the group and on the information and advice which we received in the course of our headquarters and ICP visits. Several explanatory comments about these reported problem areas are in order.

First, the matters described and discussed in Attachment F are not represented as being newly discovered problems. On the contrary, most if not all of them have been long-recognized and long-discussed by supply specialists throughout the Department of Defense. That is a key point: these are not new problems. Their solution has long required much sound work to create improved, uniform DoD-wide guidance, taking full advantage of individual Service/Agency progress. To date, there has not been a sufficiently intense program to make substantial headway in this work.

Second, because of the small size of the working group and the short time which was available for problem identification, our approach was to concentrate on supply management problems in the area of requirements. This area was regarded by the working group as having obvious future pay-off potential because of the clear readiness and economy implications of any weaknesses in the requirement process. The problem areas presented in Attachment F reflect our special focus on requirements topics and, in addition, coverage of other important topics such as categorization of items for management purposes and supply effectiveness measurement and analysis. Those who will direct and staff the

recommended permanent Supply Management Review Program organization within OASD(I&L) will have the responsibility to expand upon our problem area selections.

Third, the problem area presentations in Attachment F in some cases include suggestions concerning the direction for improvement but in no case include firm recommendations for problem solution. Many of the problem areas presented are extremely complex and, partly for that reason, are problems of long standing. The solution of the individual problems we have presented demands concentrated technical specialization and attention.

A difficult, self-imposed task was the selection of a few supply management problems, out of the many presented in Attachment F, which should be given the highest priority for future detailed review and policy development. We were concerned that, if we recommended problems which we considered the most important as the first order of business, these problems could prove so formidable, and their resolution take so long, that no early benefits from this program could be anticipated. Coupled with this was the recognition that the program recommended will certainly require a "shakedown" period for the personnel involved and the techniques and organizational relationships to be employed. However, we feel that two of the identified problem areas, while potentially controversial and of long standing, are of such a basic nature that the development of needed DoD policies in other identified problem areas is, in large measure, dependent upon their resolution.

We were, therefore, reluctant to dismiss these as the first order of business for the Supply Management Review Program even though early resolution cannot be foreseen.

For these reasons the working group concludes that the initial review and policy development efforts of the program should be directed toward one of the two problem areas selected as basic to future progress in DOD supply management improvement. These subjects are "Categorization of Items for Management Purposes" and "Supply Effectiveness Measurement and Analysis." We further conclude that concurrent efforts should be directed toward other, less complex problem areas, to the extent permitted by availability of manpower resources initially allocated to the program. After resolution of the first basic problem area, or when the availability of sufficient manpower permits, efforts can be directed to the second basic problem area.

It is, therefore, recommended that the first order of business of the Supply Management Review Program be the subject "Categorization of Items for Management Purposes," which deals with the grouping of items for the application of different management methods and intensity. Supply management practices which are linked to item categorization include: variations in management intensity (frequency and method of stock control studies, management level and intensity of requirement reviews, etc.); selection, frequency and method of reporting data for performance evaluation; stockage policy; distribution policy; stocking echelons from which asset information is available centrally; inventory

frequency and quality; selection of items for mobilization stockage; collection, purification and use of factors used in the development of levels; etc.

The management categorization of items is seen as the key pattern which enables: understandable communication between headquarters and ICPs, and among OSD and the DoD components, regarding different types of items; common application of supply management improvements which are tailored to different item groupings; and development and analysis of statistical data presented in understandable increments reflecting different item types. There is very little DoD policy in this area and, while all DoD components apply item categorization techniques, their approaches vary widely.

"Supply Effectiveness Measurement and Analysis," dealing with the evaluation of supply support of the operating forces and its cost, has been selected by the working group as the second basic problem for action by the Supply Management Review Program. Supply effectiveness is now being measured by a variety of yardsticks against standards which vary from one organization to the next and which are little more than arbitrary goals. The considerations of cost to attain a particular level of performance are usually restricted to those imposed constraints of budget limitations and manpower ceilings. We see differences in emphasis placed on different performance indicators and an inability at all management levels to compare ICP performance, or to relate operating costs, in terms of manpower, space, inventory, etc., to support of the forces. Development of DoD supply effectiveness measurement policy

will facilitate future determination of problem areas, enable assessment of cost and degree of improvement resulting from new policy guidance, and permit the performance measurement of all ICPs against common objectives.

A number of other problems, which are less complex than those discussed above and are susceptible to earlier resolution, merit high priority review attention. It is recommended that individual review efforts address the following problem areas concurrently with the reviews previously proposed:

System Requirements for Repairable Items.

This subject represents a grouping of functional problems, all relating to repairable type items, which are described within those presentations in Attachment F dealing with various requirement input factors and levels. In recommending review work initially on only the portions of these functional problems relating to repairable items, the working group is influenced by the relative complexity of repairable item requirement computations, the lack of DoD guidance in this area, and the substantial amount of funds expended in acquiring repairable items. Our observations and review of past studies indicate that repairable items represent about 75% of DoD inventory investment in secondary items, about 70% of the investment in authorized provisioning programs, and about 30% of replenishment investment programs. The lack of DoD policy, leading to widely dissimilar levels among item managers, poses major problems in interservice comparison and the equitable allocation of resources.

The working group recommends that, to insure continuing progress in policy development, this grouping of problems should be broken down and reviewed in a predetermined sequence. The first efforts should be directed to the system reparable item supply level requirements. Upon determination of supply level requirement policy, input factors required for computation of these levels should be identified and addressed.

Within supply levels, we believe that repair cycle levels, representing the major portion of reparable item requirements, should be treated as first priority. Following this, or concurrently to the extent practicable, reparable item procurement lead time, operating and safety levels should be addressed. Observations of some present practices in the establishment of operating level and lead time level requirements for reparable items indicate a need for early attention in these areas. Safety levels should be addressed last, since other requirement levels may affect or provide the basis for safety levels.

In the process of determining DoD policy for supply level requirements for reparable items, and techniques for arriving at these requirements, all input factors needed would be identified. The second part of this review and policy development effort should address input factors required, standard factor designations and definitions, and factor collection, measurement and forecasting techniques.

Additive Supply Levels Established During the Provisioning Process

Additive supply levels for this purpose are defined as all levels established during the provisioning process which are in addition to system operating, safety, procurement lead time and repair cycle levels.

Additive levels include initial equipping requirements, initial transportation pipeline levels, "negotiated" distribution requirements of field activities, and many others.

From observations of the working group, additive levels, as defined, constitute from 10% to over 50% of investment as a result of provisioning requirement determinations. An average of about 43% was noted. This depth of additive levels is, in part, predicated on a variety of policies, methods, constraints or lack of constraints for the wide distribution of new items. DoD guidance in this area is limited.

Approved investment programs for FY 1965 and FY 1966 in secondary items included over \$500 million for initial provisioning each year. Therefore, it is judged that from \$200 to \$250 million is being invested in these levels each year with no uniform guidance, methods, or means of comparability toward equitable allocation of resources.

Mobilization Reserve Requirements

Among the problem areas presented in Attachment F, are a number relating to mobilization requirements. It is self-evident that ill-conceived mobilization requirements adversely affect supply readiness and economical investment of dollar resources in materiel inventories. Difficulties and weaknesses in the determination of mobilization requirements have been reported frequently by others. Most recently, the OASD(I&L) report entitled "Progressive Refinement of Integrated Supply Management" (PRISM) of March 1965 criticized several aspects of mobilization requirements management and offered recommendations for improvement. Earlier, there was OASD(I&L) staff concern as subject area, and planning was begun for a project to review the mobilization

requirements area, more fully examine shortcomings, and prepare improved guidance. The OASD(I&L) staff interest was in part stimulated by an even earlier attack on the validity of mobilization requirements by budget examiners, with their criticisms and budget cuts expressed in Subject Issue documents. This history is reflected and reinforced by our findings of weaknesses in this area.

Three problems in the mobilization requirements area, described here briefly and in greater detail in Attachment F, are nominated for early review attention:

Item Selection. Lack of reasonable comparability among the Services in the selection of items for mobilization reserve stockage and inadequacy of the basic document (DoD Instruction 3005.5) which offers guidance for the process of item selection have been criticized before, and are addressed in the PRISM Report. While that report and the planned OASD(I&L) project in the mobilization requirements area both aim for improvements in item selection, no extensive work is currently under way. Because item selection is the initial step and a fundamental one in building item mobilization requirements, we recommend it be the first mobilization requirements topic to be the subject of careful review attention and improved guidance. Whether this subject should be examined as a project under the Supply Management Review Program will depend at the time of decision, upon the progress and plans resulting from the PRISM Report and the OASD(I&L) project on the same subject.

Requirement Factors and Computation Techniques. The disparity among ICPs in factors and techniques used to produce gross mobilization requirements, the lack of a sound rationale for some factor values used, and the lack of refinement of certain computation methods all contribute strongly to the prevailing lack of confidence in Service expressions of mobilization requirements. Complementing the necessary clean-up in the area of item selection, the development and use of logical factors and methods for computing gross mobilization requirements are recommended as the second review topic in the mobilization requirements area.

Application of Assets. This subject relates to the reduction of gross mobilization requirements by taking into consideration assets anticipated to be available on or after M-day. As described in Attachment F, the concepts found among the ICPs vary from (1) applying no assets whatever to offset gross mobilization requirements to (2) applying all of the assets which it is assumed will be available on or after M-day. The tendency, without firm guidance on the subject, is to overstate net requirements due to inadequate asset application. Further investigation and development of improved DoD-wide guidance with respect to asset application is the third mobilization requirements area nominated for early attention.

The relative priorities of the remaining problem areas described in Attachment F should be determined by the Supply Management Review Program staff, based on circumstances prevailing at the time of decision.

B. Review Guidance

In developing and recommending guidance suitable for supply management reviews, the working group took particular note of the type of reviews conducted by the Procurement Management Review Program and the type of guidance that program has employed. In the first year or two, particularly, procurement reviews were carried out activity by activity (inventory control points and other procurement activities), each review covering in a standardized way the full range of functional areas (source selection, pricing, etc.). A review guide, in the form of a detailed, 210 page Procurement Management Review Manual, was written and employed to promote comprehensive and uniform coverage of all procurement management functions at each activity reviewed.

It is evident that such multi-function reviews conducted on an activity-by-activity basis would not be well suited to the prime Supply Management Review Program goal of contributing to improved DoD-wide supply management policies. Policies usually concern functional areas - requirements determination, distribution, long supply retention, etc. If a multi-function approach to conducting reviews were used as the input source for policy improvements in such functional areas, two or three years would be required to review just the major inventory control points. (The Procurement Management Review Program required about two years to review the major procurement activities.) By the end of that time, some of the information relating to the first ICPs reviewed would be obsolete because of changes made in the interim.

If a multi-function review approach were used, the supply management reviewers would inevitably make repetitive findings at one activity

after another concerning chronic, long-present supply management problems for which supply management policy either does not exist or is not sufficiently specific. Such weaknesses have been cited often before in connection with all of the functional areas and problems mentioned at the beginning of this Section and many more. While reviews of such wide scope would undoubtedly re-identify a whole host of familiar problems, this approach does not offer the focus and the depth needed to contribute effectively to the policy solutions of the problems.

We concluded therefore that it would be necessary for each review to be functional (one problem area) as a basis for developing policy statements. Further, we see it necessary that each review be comprised of concurrent review efforts in all of the DoD components to which the review topic is applicable, first to insure that policy statements developed and recommended have DoD-wide application, and second to have maximum opportunity to consider and take advantage of progress made by the individual agencies.

Each functional review would be facilitated by a work plan which defines and describes the problem area, states the objectives of the review, and provides practical and detailed instructions for carrying out the review. This material should be prepared on a current basis shortly before commencing the review to reflect the most timely knowledge of policies, practices and reports of difficulties in each subject matter area. Especially when the

reviews are to be undertaken through collaboration of supply specialists and internal auditors, as discussed in the next part of this Section, the review instructions should be comprehensive and detailed in order to make available to the auditors the knowledge and advice of supply management specialists.

It is therefore recommended, in carrying out the Supply Management Review Program: (1) that the reviews be of the functional type, as described above; (2) that, at the time of each review, current and detailed review guidance be prepared including problem description, review objectives, and review procedures; and (3) that, for reviews to be conducted by audit personnel, the review guidance be a product of collaboration between OASD(I&L) and OASD(Comp), as provided in the proposed DoD Directive (Attachment G).

C. Organization and Staffing

For reasons stated earlier, it is apparent that the organization responsible for the Supply Management Review Program must have the capability of coordinating and conducting functional reviews of complex supply management problems concurrently in all the Services and DSA, analyzing findings, and setting forth recommendations with respect to improved DoD-wide supply management policy. A primary aim of the working group was to devise an organizational arrangement which would accomplish the objectives of the program with minimum duplication of existing review organizations and review impact on operating activities.

Because of the need to conduct functional reviews on a DoD-wide basis, as discussed earlier, and because of the complexity of most of the problem areas to be examined, extensive central planning and coordination will be necessary. Such tasks as selecting problem areas to be reviewed, allocating review resources, scheduling concurrent review efforts on a given functional subject throughout the DoD, and integrating the work of individual review groups demand organization and control at the OSD level.

Several alternatives for the organization and staffing of the Supply Management Review Program were considered. These varied from assigning responsibility for this program in its entirety to existing organizational components throughout the Department of Defense to creating a completely new organizational structure for this purpose.

One alternative considered is the assignment of responsibility for coordinating and conducting the necessary reviews to existing supply

management components of the Military Departments and OSD. There are, in fact, various groups conducting reviews of certain segments of supply management in connection with the review of requirement determinations, justification of budgets, and in the conduct of other supply management functions (i.e., system design, planning, etc.). Several advantages can be seen in this alternative. It would avoid significant reorganization, related delay, and substantial additional cost. This alternative, however, is not considered at all feasible because existing supply management organizations are already hard-pressed to carry out their current tasks. It was concluded that the objectives of the Supply Management Review Program would not be attained because resources to carry out the necessary reviews would likely be diverted to deal with day-to-day operating problems.

A completely new organization throughout the Department of Defense, staffed by supply specialists, to conduct the Supply Management Review Program was considered as another alternative. This course can be inferred from the "Defense Procurement Management Small Purchase Review" report which recommended the Supply Management Review Program be established "along the lines of the Procurement Management Review Program." A summary here of the organization and operations of that program might be useful.

The Procurement Management Review Program organization consists of a division in OSD and review organizations in each of the Military Departments and DSA. There are 43 people directly concerned with the program, including eight analysts at the OSD level. Procurement

management review teams may be either DoD (joint service) teams for DoD reviews, or service teams for review of service organizations. Normally the joint teams consist of seven or eight members. Service teams of four or five analysts each spend from four to six weeks at a major purchasing activity.

The objectives of the Procurement Management Review Program require that the operations of procurement organizations be reviewed to assist in improving their procurement efficiency and effectiveness. The principal technique which has been employed is to review the performance of procurement functions on an activity basis.

The working group concluded, however, that creating a new supply management review organization comparable to that of the Procurement Management Review Program would not be the most desirable alternative. The major factors which influenced this judgment are (1) recognition of the size of the supply management review task and (2) the objective of minimizing duplication of existing review efforts:

a. Task size

It is significant that there is a vast array of supply management problem areas for which there is inadequate DoD policy guidance. This is illustrated by the presentations in Attachment F, which are by no means all-inclusive. (In contrast, the Armed Services Procurement Regulation provides comprehensive guidance in the procurement area.)

In addition to there being a great number of supply management problem areas, many of them are extremely complex. This

is particularly true of some of the most important areas to be addressed, including those top priority problem areas discussed in the first part of this section. It can be foreseen that review of such problems and development of policy recommendations may be extremely time-consuming, and that a sizable staff would be required to make much headway against the large number of problem areas to be attacked.

It should be noted that a 70-man staff had originally been recommended for the Procurement Management Review Program, and that that program now operates with a staff of 43. In view of the greater size and complexity of the supply management review task (an opinion which some procurement management review personnel share), a new organization created to do this job would theoretically require a much larger staff than that used for procurement management review. We cannot offer a "correct" figure; for all practical purposes, the size and complexity of the task creates an immeasurable large workload for any small size staff. On the other hand, it is the view of the working group that it would be difficult to sell the idea of creating a new, large organization and to obtain the necessary manpower ceiling increase, especially in the face of existing investment in review manpower by other review organizations.

b. Duplication of review effort

The second major factor influencing the working group against recommending a new, self-sufficient organization, comparable to the Procurement Management Review Program organization, was the possible extent of duplication of other review organizations, particularly internal audit, in terms of review effort and impact on

activities reviewed. The working group was advised of the mounting concern by the Services over the impact of review programs already in existence.

Sensitivity to duplication was evident in an OASD(I&L) staff report of December 1961 which recommended the creation of a procurement review program. There it was stated that the establishment of a competent review program would enable "the elimination of such departmental audit and inspector general activities as are currently operating in the area of procurement review." This early aim, stated in the preliminary planning report, was not included in the ultimate specification of the objectives and responsibilities of the Procurement Review Program, nor is it currently considered a desirable goal. On the contrary, the work of other review agencies, such as internal audit, is considered by Procurement Management Review personnel to complement their own activities.

Those responsible for internal audit have not reduced their effort in the review of procurement functions. Procurement Management Review personnel indicate that they review almost all audit reports but find few which contribute to procurement review projects; however, it was noted in discussing this aspect with audit personnel in the field that internal audit personnel make little reference to procurement management review reports. It was held by audit personnel interviewed that, to validate other functions at an activity, a review of procurement functions is essential. The Assistant Secretary of Defense (Comptroller) on September 19, 1964, issued a memorandum to the Assistant Secretaries for Financial Management of the Military Departments and the Comptroller of the

Defense Supply Agency which required that audit programs be amended to expand audit coverage of procurement practices and procedures.

None of the foregoing is intended to disparage, in any sense, the effectiveness of the Procurement Management Review Program. The view of the Assistant Secretary concerning that program is clearly expressed in his memorandum of February 6, 1965 (Attachment A). Further, a number of favorable comments were made to us by operating personnel regarding the effectiveness of the Procurement Management Review Program. The sole point here is that we should seek an organizational structure and organizational relationships for the Supply Management Review Program which will minimize duplication with other review or audit programs, but take full advantage of the resources and products of those programs.

The organization and staffing alternative selected by the working group as being most suitable for the Supply Management Review Program has the following elements, discussed in greater detail in the following pages:

a. A small new staff within OASD(I&L) to manage the program, select review areas, advise all DoD components involved of review plans and objectives, handle arrangements with other organizations participating in the program, and conduct occasional reviews on a selected case or exception basis.

b. The staff within OASD(Comp) to do the planning and coordination work necessary to enable internal audit personnel of the Military Departments and DSA to undertake supply management reviews.

c. The internal audit staffs of the Military Departments and DGA to carry out the major portion of the Supply Management Review Program field work.

One important advantage of this alternative is that possible duplication between supply management reviews and internal audits would be minimized, also avoiding both duplication in manpower resources and the double impact on operating personnel. This approach would provide the necessary coordination of review effort DoD-wide and has the potential of acquiring sufficient manpower to make substantial inroads on the large number of supply management problem areas.

Audit offices are already staffed, minimizing organizational and staffing problems, and the program could be implemented at an early date more effectively using such existing organizations. Among the factors supporting employment of audit resources to undertake the majority of the supply management reviews are (1) the basic purpose of internal audit, and (2) the extent to which audit agencies are already involved in the review of supply management functions.

The recently revised DoD Directive 7600.2, "Department of Defense Audit Policies," August 19, 1965, stated: "The purpose of internal auditing is to provide those responsible for management at all levels with an independent, objective, and constructive evaluation of the effectiveness and efficiency with which managerial responsibilities (including financial, operational, and support activities) are being carried out. All organizational components and levels of operations will be subject to independent and comprehensive audit

review and appraisal. Internal audit activities will include examining and appraising policies, systems, procedures, records and reports relating to programming, budgeting, accounting, procurement, supply, financial or business transactions of all kinds, and other operations having an impact on the expenditure of funds, utilization of resources, or effective accomplishment of management objectives." Auditors, under this directive, are required not only to report facts ascertained, but to make recommendations in connection therewith to appropriate levels of management.

The ASD(Comptroller) is responsible for audit policy which is implemented through the audit agencies of the Military Departments and other DoD components authorized to have audit agencies. This includes responsibility for developing policies, plans, and procedural guidance for internal audit, the coordination of audit matters within DoD and with outside agencies, and dissemination of audit information within OSD offices. One of the functions of OASD(Comp) is the coordination of audits within DoD which involve two or more of the Departmental audit agencies. Although the audit agencies of the Military Departments and DSA determine the areas to be audited and publish audit schedules, when effective audit coverage of a program or function involves matters which extend across departmental or organizational boundaries, "assist audits" are arranged by OASD(Comp) where necessary.

Emphasis has been placed on the audit of supply management functions since the publication of an OASD(Accounting and Audit) Memorandum of October 3, 1962, "Expanded Audit Coverage of Supply Management Operations." For audit purposes, DoD Instruction 7600.1, "Summary

Report of Audit Operations," of July 1, 1964, defines "supply management" as follows:

"This area reflects the management and control of inventories accounted for in supply systems from development of requirements until they have been issued to a using organization It includes appropriate depot operations, inventory control, storage and issue and requisitioning, transportation of things, logistic operations at aerial and sea ports, functions performed by supply management offices such as Inventory Control Points and Inventory Managers. Some of the identifiable functions are: Military personal property inventories, stock fund inventories and related accounting systems, warehousing, air and sea cargo transportation facilities, stock balance and consumption reporting systems and computation of requirements Excluded from this area are maintenance and overhaul, procurement, and contract administration."

As its title indicates, DoD Instruction 7600.1 calls for a summary report of audit operations by the audit organizations of the DoD components. Resulting data are tabulated on the following page:

INTERNAL AUDIT MANPOWER ^{1/}

(Direct Audit Effort Only)
For Year Ending June 30, 1965

<u>Service/Agency</u>	<u>Audit Man-Years</u>	<u>Audit Man-Years for Supply Management</u>	<u>Percent of Time for Supply Management</u>
Army	533	170	32%
Navy	307	71	23%
Air Force	859	233	27%
DSA	40	24	60%
TOTAL	1739	498	28%

1/ Source--Preliminary Information Furnished by OASD(Comp)
(Accounting & Audit Policy)

Under the expanded audit coverage of supply management, there is considerable manpower devoted to review of ICP functions. The data on the following page relate to the ICPs visited by the working group:

AUDIT MANPOWER AT ICPS

<u>ICP</u>	<u>Auditors in Residence</u>	<u>Annual Allocation of Man-Years Estimated for Supply Management</u>
AVCOM	17 ^{1/}	16
SPCC	5 ^{2/}	5
SAAMA	26	14
DGSC	N/Av. 3 [/]	N/Av.
DPSC	N/Av. 3 [/] 4 [/]	N/Av.
ECOM 5 [/]	N/Av. 3 [/]	20-22 (Est.)
MCSA	N/Av. 3 [/] 6 [/]	N/Av.

1/ Billets were approved to expand this office to 22 members.

2/ Plans were underway to expand this office to 7 members.

3/ Served by regional/area offices; man-year data not readily available.

4/ DPSC served by Philadelphia office of DGA Eastern Regional Office. Thirty-two members are located in Philadelphia branch.

5/ Special visit by one member of working group.

6/ MCSA served by NAAO Philadelphia which has had 38 members in the Philadelphia/Mechanicsburg area.

There is a trend of internal audit toward the more comprehensive type of review. Examples of such audits are the recent audit on evaluation of the programs for interservicing of assets within DoD and one currently being conducted to improve the Military Assistance Program. Such examinations are somewhat comparable to the complex, functional reviews envisioned as being mandatory in the Supply

Management Review Program. The comprehensive audits are conducted on a functional (lateral) basis and on an integrated (vertical) basis. Both types of audits, however, are detailed examinations of extremely complex problems. The degree of complexity can perhaps be illustrated by the allocation of resources to examples of these audits, as shown below:

Examples of Recent Comprehensive Audits
in Various Areas of Supply Management

	<u>Title (Time Required)</u>	<u>Type/Number of Activities Visited</u>	<u>Direct Audit¹ Man-Years</u>
ARMY	NIKE-Hercules Audit (6/64 - 3/65)	5 NICPs 7 Army Depots 4 Proc. Districts 2 Hdqtrs. Offices 6 Army Hdqtrs. 32 Class I Installations 83 Missile Units 4 USAEUR 7 USAPAC 8 Contractors' Plants 4 Misc.	81
NAVY	Supply System Responsive- ness to Fleet Requirements for Ships Assemblies & Repair Parts (5/63 - 6/64)	1 DCF 5 Supply Centers 3 Shipyards 14 Others	54
AF	Selected Factors and Requirements Computa- tions Audit (9/64 - Not Completed)	AFHQ 9 AMCS 182 Bases Selected Contractors	114
DSA	Material Returns Audit (9/64 - 4/65)	11 DSA NICPs/Depots 12 Army 25 Navy 22 Air Force	8 DSA 4 Army 14 Navy 4 Air Force <u>104 Total</u>

^{1/} Does not include administrative effort nor time of operating personnel at installations.

A conceivable disadvantage of the selected organizational and staffing approach, with its heavy reliance on audit manpower to conduct supply management reviews, centers around the necessary division of responsibility, and possible disagreements, between OASD(I&L) and OASD(Comp). The ASD(I&L) would not have as great a degree of control over the Supply Management Review Program as would be possible if all personnel required for the program were assigned to his office. ASD(I&L) has functional responsibility for supply management and logically should have control and direction of the program. However, large-scale employment of audit resources for the Supply Management Review Program will require ASD(I&L) to share program responsibilities with ASD(Comp) who oversees the audit function.

Our proposal also may be judged as having a disadvantage from the Comptroller viewpoint. We see the principal responsibility for selecting Supply Management Review Program review areas to be vested in OASD(I&L), and the principal vehicle for undertaking these reviews to be the audit agencies. Under this arrangement, auditors will not be free to select their own review areas, to the extent that they participate in the Supply Management Review Program. This restriction may be difficult for auditors to accept, particularly in the light of their traditional independence based on statutory authority.

Finally, a third possible disadvantage in our recommended approach relates to the quality of the Supply Management Review Program audit reports and the probable extent to which supply management personnel will make use of such reports. The members of the working group, and

some who have discussed this subject with us, recognize that the scope and usefulness of past internal audit reports have varied considerably. We attribute this, in some measure, to the frequent use of activity-by-activity (posts, stations, ICPs, etc.) audits which have not dealt in sufficient concentration and depth with the supply management problems demanding attention. Audit personnel strongly commented to the working group on a number of occasions that, in their view, supply management officials seem to make very little use of audit reports. Auditors complained that most of the supply management problems and weaknesses they observe and report are not new; that they had observed and reported them before but that apparently nothing had been done.

We feel that closer collaboration between supply and audit personnel, called for under the recommended organizational relationship, will contribute to improved and more useful audit results. Specifically, the role we have spelled out for supply management personnel - to select problem areas, set forth problem descriptions and review objectives, and participate in the development of detailed guidance for the conduct of Supply Management Review Program reviews by audit personnel - would inevitably make the review results more useful to supply management officials.

In short, the working group does not consider that the several potential disadvantages of the recommended organizational alternative constitute a serious threat to relative effectiveness of the proposal.

The approach selected by the working group - reliance upon audit manpower and capability to handle a large part of the job - was

discussed informally in the late stages of our study with OSD supply and audit officials. Without suggesting a commitment which does not exist, but only to indicate that some staff work in this area has been done, we report that reactions to the plan were strikingly favorable.

It is therefore recommended:

a. That a small staff be established within OASD(I&L) to manage the Supply Management Review Program, carrying out the necessary functions, including the following:

1. Select the supply management problem areas to be incorporated in annual and longer range review programs, and establish review topic priorities.
2. Advise the Military Departments, DSA, and other DoD agencies, as appropriate, of such review plans and objectives for developing uniform DoD-wide policies in specific supply management functional areas.
3. Arrange with other OSD organizations and other DoD components for their participation in the Supply Management Review Program.
4. Develop specific problem descriptions and review objectives.
5. Assist in the preparation of, or review, detailed guidance for the conduct of individual reviews to be made by participating organizations.
6. Directly undertake reviews of selected supply management areas where the urgency of OASD(I&L) interest or other special circumstances make the assignment of such subjects to participating organizations infeasible.

7. Obtain and analyze reports and other required information from participating organizations.

8. In coordination with other OSD organizations involved, develop proposed DoD-wide policy guidance indicated to be needed by problem area reviews and, when appropriate, staff proposals with the Military Departments, DSA and other agencies involved.

b. That OASD(Comp) participate in the Supply Management Review program by coordinating the audit effort necessary to accomplish the objectives of the program and carrying out the necessary functions, including the following:

1. Make arrangements with OASD(I&L) concerning the extent of Supply Management Review Program participation by audit personnel throughout the Department of Defense; direct Military Department and DSA audit participation; and, when indicated by changes in workload or staffing, arrange for adjustment in audit participation.

2. Recommend to OASD(I&L) areas for supply management review.

3. Allocate designated audit resources to meet established review programs.

4. Develop audit guidance for each review topic in collaboration with OASD(I&L).

5. Assign to audit agencies individual or joint participation in particular reviews, as appropriate, and coordinate such audit efforts.

6. Obtain from participating audit agencies reports which offer findings, evaluations and, whenever possible, recommendations with respect to DoD supply management policy.

7. Provide to OASD(I&L), for each supply management area reviewed, a single report which offers findings, evaluation and, whenever possible, recommendations with respect to DoD supply management policy.

c. That the Military Departments and DSA participate in the Supply Management Review Program as follows:

1. Collaborate with OASD(Comptroller) in establishing arrangements for audit personnel of the Military Departments and DSA to assist in the Supply Management Review Program within existing resources; undertake such review work; and report results, including recommendations for changes in supply policy whenever possible, to OASD(Comptroller).

2. As a minimum, establish and designate a point of contact and coordination within the supply management staff of each Military Department and DSA to be responsible for communication and collaboration with OASD(I&L) on such matters as problem area identification; selection and priorities; guidance for conduct of reviews; and participation in reviews, on a selected case basis, by Departmental and Agency supply management personnel.

A decision concerning the size of the staff suitable for the recommended new Supply Management Review organization in OASD(I&L) must be rather arbitrary; there is a huge amount of work to be done, leaving it a trade-off between size of staff and length of time to make progress in this work. We are convinced that the range and complexity of supply management problems facing such an organization and their payoff potential warrant a significant investment in manpower resources.

There are, however, recognizable constraints which tend to limit such a recommendation. Chief among these is, we believe, that from a practical viewpoint the proper approach is to attack individual, significant problems in order of importance. While several problem areas can be addressed by separate reviews carried out in the same time frame, any attempt to extensively review and develop better policy across a broad front in a single review effort would be impractical and would not be successful. In addition, on a long term basis, as the program progresses the range of problems requiring policy improvements should decrease. For these reasons, we recommend that a minimum staff of six supply specialists be established in OASD(I&L) to start the program. As the program proceeds, this staff could be expanded, if warranted, based on increased availability of audit effort for supply management reviews, the necessity for more reviews outside the audit program than are now foreseen, or the decision that benefits derived could significantly increase by such an expansion.

The placement of this new organization within OASD(I&L) is strongly suggested (1) by the nature of the subject matter with which it will be engaged, and (2) by the need to keep this group a separate entity. On the first point, we anticipate that the great majority of the matters to be dealt with under the Supply Management Review Program will be within the assigned span of authority and responsibility of the existing Supply Management Policy Directorate. Virtually all of the problem areas described in Attachment F fall into this category. On the second

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point, we see clearly that the Supply Management Review Program must be managed by an organizational entity in which the personnel are not routinely exposed to day-to-day calls to handle "fire drill" and correspondence deadline-type work which would distract personnel from carrying out the program. A separate division dealing exclusively with Supply Management Review Program business appears to be a requisite.

It is therefore recommended that the responsibility for directing the Supply Management Review Program be assigned to a new division of the Supply Management Policy Directorate of OASD(I&L), to be staffed with six supply specialists capable in analytical work with diversified experience in Defense supply management.

One last comment and suggestion relates to the earlier recommendation that OASD(Comp) make arrangements with OASD(I&L) concerning the extent of audit personnel participation in the Supply Management Review Program. As indicated earlier, 1,740 man years were devoted to internal audit in FY 1965. Of these, about 500 man years were expended in the supply management area. There are a number of reasons, two in particular, why it appears wise to schedule initially a limited portion of total audit manpower to this new program. Audit officials will continue to require that a substantial portion of the audit manpower now working in the supply management area be available to make audits at the time, at the place, and on subject matter independently selected by auditors. We also foresee that some learning time will be required to effectively exploit the working relationship

and procedures we have proposed between supply management and internal audit. During this shakedown period, we anticipate that both the new OASD(I&L) Supply Management Review Program staff and the OASD (Comp) staff coordinating audit participation will develop increasing capability to direct and manage the program, enabling a later build-up of audit manpower which can be effectively employed. It is therefore recommended that, in making arrangements for internal audit participation in the Supply Management Review Program, OASD(Comp) give favorable consideration to using for this purpose up to one-third of the audit manpower previously devoted to work in the supply management area, and that the employment of this level of audit manpower be phased in gradually in the first one to two years of the Supply Management Review Program.



ASSISTANT SECRETARY OF DEFENSE
WASHINGTON, D.C. 20361

ATTACHMENT 1

February 6, 1965

SR
INSTALLATIONS AND LOGISTICS

MEMORANDUM FOR THE ASSISTANT SECRETARY OF THE ARMY (I&L)
THE ASSISTANT SECRETARY OF THE NAVY (I&L)
THE ASSISTANT SECRETARY OF THE AIR FORCE (I&L)
THE DIRECTOR, DEFENSE SUPPLY AGENCY

SUBJECT: Establishment of a Supply Management Review Program

In a report by my Procurement Review Staff of December, 1964 entitled "Defense Procurement Management Small Purchase Review," it is recommended that this Office establish a Supply Management Review Program along the lines of the Procurement Management Review Program.

During the first two years, about fifty reviews of procurement activities have been made. These activities obligate about 80% of Defense procurement dollars. As a direct result of these reviews and the ensuing recommendations, procuring organizations have eliminated duplicate effort and streamlined procedures; reduced administrative lead-time and provided more time for the procurement function; reduced the use of cost-plus-fixed-fee contracts and improved the selection of contract types; broadened the use of competitive procurement; and improved pricing procedures.

I am convinced that comparable gains can be realized through a similar review mechanism in the supply management area. Accordingly, I have decided to establish a Supply Management Review Program. This program will be supervised by the Supply Management Policy Directorate within this Office.

I believe it will be advantageous to establish a working group, in which your representatives may participate to develop organizational and operating plans and an itinerary for initial reviews. These reviews, which we expect to launch about April 15, 1965, should serve as sound experience from which continuing review procedures may be derived. The group will be headed by Mr. Walter B. Goldfinger of this Office. I would appreciate receiving within forty-five days your nomination of one individual who can assist in establishing this new program.

(Signed)

PAUL R. IGNATIUS
Assistant Secretary of Defense
(Installations and Logistics)

ATTACHMENT B

COMPOSITION OF THE WORKING GROUP

The working group was chaired by Mr. Walter B. Goldfinger, OASD (I&L). The Service/Agency representatives on the working group were:

Mr. Henry M. Levin, Army

Commander Frank N. Worthen, SC, Navy

Mr. Wendell T. Allen, Air Force

Mr. William Francier, Marine Corps

Mr. James H. Somes, Defense Supply Agency



ASSISTANT SECRETARY OF DEFENSE

WASHINGTON, D.C. 20301

ATTACHMENT C

SR

INSTALLATIONS AND LOGISTICS

15 April 1965

MEMORANDUM FOR THE ASSISTANT SECRETARY OF THE ARMY (I&L)
THE ASSISTANT SECRETARY OF THE NAVY (I&L)
THE ASSISTANT SECRETARY OF THE AIR FORCE (I&L)
THE DIRECTOR, DEFENSE SUPPLY AGENCY

SUBJECT: Supply Management Review Program

In reference to my memorandum of February 6, 1965, a working group has been organized, under the project direction of Mr. Walter B. Goldfinger, Staff Director of the Requirements and Provisioning Division, Directorate for Supply Management Policy of my office. Service/agency representatives named to participate full-time are:

Henry M. Levin, Army
Frank N. Worden, Cdr. SC, Navy
Wendell G. Allen, Air Force
William Francoise, Marine Corps
James H. Somes, Defense Supply Agency

This group will work as a single body toward a completion date of October 19, 1965. Specialists in selected functional areas may, from time to time, be requested from the military services and DSA to assist the group in an advisory capacity.

To amplify my February 6 memorandum, I look to the Supply Management Review Program for an appraisal of problems in the supply management policy area and to serve as an important input source for more uniform DoD-wide supply policy in the major problem areas. This program is intended to provide this office and echelons of management within the departments and agencies (a) advice concerning the relative importance of existing supply problems, and (b) recommendations with respect to the relative priorities for their solution through a centrally organized development effort.

I visualize that the Supply Management Review Program will have a DoD-wide perspective, a careful selectivity in the supply management areas to be reviewed, and a pronounced emphasis on policy improvements.

In the latter respect, the program should furnish a basis for comparing and selecting the most effective policy/practices employed by one or more of the agencies for use by all agencies where appropriate. These and any other unique characteristics of the Supply Management Review Program must be developed further to minimize duplication in objectives and approach between this program and other review efforts.

I will expect the working group, with your assistance and advice, to:

1. Select supply management areas of major interest from the standpoint of military readiness and economy, for the purpose of future emphasis in supply management reviews.
2. Develop a standard guide which cites the areas to be covered by supply management reviews and which directs the conduct of the reviews; and undertake pilot reviews to the extent necessary to determine the adequacy of the review guidance.
3. Develop a DoD Directive which will formally establish the Supply Management Review Program, cite its purpose and scope, prescribe organizational arrangements and relationships, and set forth the responsibilities of the Office of the Secretary of Defense, the Military Departments and the Defense Supply Agency.

In order to insure that the efforts of the working group are oriented toward major areas of supply management interest it is desirable that, prior to visits to field installations, meetings are held with at least the department/agency elements listed below:

Army - Office, Deputy Chief of Staff for Logistics
Army Materiel Command
Supply and Maintenance Command

Navy - Bureau of Supplies and Accounts

Air Force - Directorate of Supply & Services, Hq. USAF
Headquarters Air Force Logistics Command

Marine Corps - Headquarters Marine Corps

DSA - Headquarters Defense Supply Agency

Prior to these meetings, the working group will provide an outline of topics to be covered, an agenda and a schedule. Subsequent to service/agency meetings discussed above, visits will be made to

selected field installations where supply management on a large scale is performed. These activities will be selected after discussion with service/agency headquarters and will be of sufficient numbers to provide a thorough understanding of the differences which exist within and among the services.

I am confident the Supply Management Review Program will identify areas in which important improvements can be made. By stimulating more responsive supply support and additional cost savings, this work will contribute directly and indirectly to increased readiness of the operating forces.

All Department of Defense agencies involved are requested to cooperate fully in developing and initiating this new program.

(Signed Paul R. Ignatius)
PAUL R. IGNATIUS
Assistant Secretary of Defense
(Installations and Logistics)

ATTACHMENT I

HEADQUARTERS VISIT SCHEDULE

Service/Agency headquarters visits were made as follows:

Air Force	April 26, 1965
Defense Supply Agency	April 27, 1965
Marine Corps	April 29, 1965
Air Force Logistics Command, Wright-Patterson Air Force Base, Ohio	May 4, 1965
Army	May 6, 1965
Navy	May 10, 1965

ATTACHMENT E

ICP VISIT SCHEDULE AND GUIDANCE

<u>ICP</u>	<u>Inclusive Dates</u>
Aviation Command Army St. Louis, Missouri	May 24-28, 1965
Ships Parts Control Center Navy Mechanicsburg, Pennsylvania	June 7-11, 1965
Defense General Supply Center Defense Supply Agency Richmond, Virginia	June 21-23, 1965
San Antonio Air Materiel Area Air Force San Antonio, Texas	June 28 - July 1, 1965
Defense Personnel Supply Center Defense Supply Agency Philadelphia, Pennsylvania	July 6-8, 1965
Marine Corps Supply Activity Marine Corps Philadelphia, Pennsylvania	July 12-14, 1965

A copy of the type of guidance provided to the ICPs prior to working group visits is contained in the following pages.

Supply Management Review Program

ICP Visit Guidance

1. General

The information contained in the following paragraphs and in Attachment 2 is provided to seek standardization of coverage during ICP visits, provide guidance and time for preparation, lead to participation by individuals qualified to discuss subjects in detail, and form the basis for presentations.

2. First Day - Supply Management Problem Areas

During earlier orientation visits in OSD and Service and DSA headquarters elements, stress was placed on problems in supply management. These discussions have given the Working Group some understanding of the problems at these levels. It is now necessary to (1) obtain ICP information regarding the scope and importance of supply management problems at that level and (2) learn of ICP's current or proposed problem solutions.

To accomplish this, it is desirable that each ICP visited devote all or a major portion of the first day of the visit to this subject. Presentations or discussions should describe major ICP problem areas, their relative importance, their causes to the extent known, and proposed solutions where thinking has progressed to that point. To provide a better understanding of the types of problem areas of interest to the Working Group, the following are mentioned as areas you may wish to discuss: limitations of ADP equipment or techniques, "system" requirements versus higher "distribution" requirements, faulty requirements input data, difficulty in selection of items for mobilization reserve stockage, and problems in MAP support guidance interpretation. The foregoing are illustrative, far from all-inclusive, and are not intended to imply any restriction of subject matter. Areas to be considered in explaining problem causes include lack of policy guidance, policy guidance difficult to interpret or implement, time compression, training, etc.

In addition to discussions by your representatives and the Working Group of the aspects of problems presented by ICP personnel, the Working Group will also offer for discussion areas mentioned as problems by other organizations. The purpose of the latter discussion, where topics had not been presented as problems at the ICP being visited, will be to determine the local solution or the reason the problem does not exist.

2. Second Morning - Existing Review Programs

Since the purpose of the working group is to develop a Supply Management Review Program, it is important the group become aware

of all existing review programs, including those conducted through on-site inspection and those which generate from data accumulation, presentation and analysis. Departmental/agency review programs have been covered in a general way at the headquarters level but it is desirable to deal with the subject in considerably more detail at the ICP level.

It is requested that this subject be opened by a presentation covering reviews being made of the ICP by higher headquarters and those which are self-imposed. This briefing should provide detail regarding the frequency; technique; preparation required, such as generation of ADPE print-outs, file segregation, questionnaire completion, etc.; and the composition of the group making the review. Special attention should be given the results of these reviews and the uses made of the review products with emphasis on problem areas highlighted and policy changes which have resulted from these efforts.

3. Second Afternoon - Discussion of Supply Management

Certain areas of supply management are to be covered in more detail as outlined in paragraph 4. It is not desired, however, to limit the subject matter of the orientation visit to those specified in paragraph 4. During the second afternoon the Working Group should be apprised of other areas or functions which constitute a significant workload at the ICP. While formal presentations are optional, it is desired that the Working Group meet with individuals qualified to discuss these areas on an informal basis. Examples, illustrative and not all-inclusive, of subjects which may be appropriate are ICP responsibility for technical data and cataloguing, utilization and disposal programs, organization and resource planning, etc.

4. Remainder of Visit - Working Level Orientation

The remainder of the visit will be devoted to a study of specific areas of the ICP operation. The Working Group will divide into three teams of two men each; these teams will simultaneously obtain a detailed orientation in the policies, procedures, formulas, etc., for (1) provisioning requirements, (2) replenishment requirements, and (3)a. mobilization requirements, and b. special program requirements. Additional guidance with respect to each of these areas is contained in Attachment 2.

During this phase of the orientation, it is planned to review the methods involved with the working level personnel at the ICP who have the responsibility for performing these operations. Since the Working Group does not wish to divert a large number of personnel from their regular work, it is suggested that a minimum number of individuals knowledgeable in the areas named serve as focal points for the discussion and that other individuals be called to participate as needed.

Three meeting places suitable for the accommodation of the two-man teams and the related ICP personnel will be required. Since some of the time will be spent in a detailed review of work sheets, etc., table space will be required.

Supply Management Review Program

Guidance for Selected Orientation Areas

1. General

Detailed orientation will be sought in the areas briefly outlined in the following paragraphs. In each area, there will be interest in reviewing working level detail, including supply control studies, program data sheets, input data, requirements formulas, etc.

The orientation would be accelerated if a few computations (several copies) representative of policy guidance were selected in advance, and all guidance and working papers required for a detailed exploration of the process assembled for reference. Examples chosen should be indicative of the normal methods used as well as some to illustrate deviations from the usual method. It would be most beneficial if the individuals who actually made the computation and/or are responsible for the item could participate in the discussion.

At the time of this comprehensive on-site orientation, requests may be made for copies of related papers, including applicable regulations, directives, and other guidance and working documents.

2. Provisioning Requirements

Coverage of:

- a. Policies and procedures for all elements of provisioning requirements, such as initial allowances, operating level (usage data development period level), safety level, procurement lead time requirement, initial overhaul requirements, etc.;
- b. Determination of requirements within each of the foregoing requirement elements for consumable items, repairable items, insurance items, high-value items, shelf life items, etc.;
- c. Distribution criteria and/or distribution restrictions;
- d. Program data used in determining provisioning requirements, such as maintenance plans; support concepts; operational plans; R&D, test and evaluation reports, etc.

3. Replenishment Requirements

Coverage of:

- a. Classification of items into management categories;

- b. Criteria/procedures for handling items as "replenishment" items (instead of "new" or "provisioning" items);
- c. Kinds/sizes/basis of supply levels for various management categories of replenishment items;
- d. Knowledge and control of assets, and use of asset data (including validation techniques);
- e. Knowledge and use of demand and other requirements input data (including validation);
- f. Demand forecasting techniques;
- g. Requirement computation techniques/forms/formulas, including basis for judgment deviations from standard procedures;
- h. Requirements review or audit policies and procedures (including post-award review);
- i. Stratification;
- j. Budgeting.

4. Mobilization Reserve Requirements

Coverage of:

- a. Policies, procedures and specific criteria used in selecting items for mobilization reserve stockage;
- b. Policies and procedures used in computing mobilization acquisition and retention levels, including application of peacetime on hand and on order assets to gross mobilization requirements; application of assets via post-M Day orders; and consideration of substitutes;
- c. Criteria for categorizing mobilization requirements as "prepositioned."

5. Special Program Requirements

Coverage of:

- a. Guidance with respect to "non-recurring" program or project requirements;
- b. Techniques and methodology employed in the determination of these requirements;

- c. Control of assets reserved for special program requirements, including phase-out of requirements as assets are issued to satisfy the requirement and cancellation of requirements when asset issues to satisfy the total requirement are complete;
- d. Controls to avoid using special program requirement issues as a factor in replenishment requirement determinations;
- e. Magnitude in terms of frequency of establishing or re-computing special program requirements, number of line items, dollar value, workload involved.

ATTACHMENT I

This attachment contains detailed analysis of the 19 problem areas considered by the working group to be of sufficient importance to be made a part of this report. These problems are not listed in order of importance, except for the first two which concern basic supply management matters considered fundamental to an orderly supply management improvement program.

Each of the following problem presentations sets forth existing DoD policy; describes the problem area, with special emphasis on the differences in findings at the ICPs visited and the relationship of weak or absent DoD policy to these variations; and offers the working group's conclusions.

The problem areas discussed, in the order of their presentation are:

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CATEGORIZATION OF ITEMS FOR MANAGEMENT PURPOSES

A. Existing DoD Policy.

No single DoD Instruction provides policy for the categorization of items for management at the ICP level but several directives make reference to the subject.

The most detailed guidance is provided by DoD Instruction 4140.24, September 10, 1964, subject: "Requirements Priority and Asset Application for Secondary Items." This directive, in paragraph VII, provides special instructions pertaining to selective management inventory segments and states: "A. Stratification will be accomplished in such a way that separate summary financial reports can be prepared for (1) insurance items, (2) provisioning items (exclusive of insurance items), (3) reparable items and, (4) non-reparable items, when these breakouts would be significant" Paragraph VIII of the same Instruction further defines the management segments referenced above but adds no more specific requirement for their use.

DoD Instruction 4140.7, January 12, 1965, subject: "Control, Supply and Positioning of Materiel," expresses the policy on centralization and decentralization of materiel management. It defines centralized items as "those items for which the cognizant ICP of a Military Department or the DSA has prescribed central management and procurement, i.e., central requirements determination, supply, control, distribution, stockage and procurement direction by the cognizant ICP". It defines decentralized items as "those items for which the cognizant ICP of a Military Department or the DSA has prescribed local management and procurement by bases, posts, camps and stations

and other DoD activities, or fabrication by organizational and intermediate maintenance activities" This directive, however, does not provide any guidance for any further management categorization of centralized items at the ICP level.

DoD Instruction 4140.4, September 3, 1964, subject: "Management of the Material Pipeline, Including Levels of Supply," makes reference to "characteristics of the item or category" and to "inventory investment" in addressing the subject of frequency of replenishment shipments in relation to the establishment of levels.

Taken together, these directives seem to imply that the criteria for management attention should include a combination of factors relating to the reparability of the item, the dollar value of the demand and/or the unit price, and possibly demand characteristics, as reflected by references to insurance items and provisioning items.

B. Problem Description.

ICP item management categories are established primarily to enable the application of management techniques of differing types or intensities, selectively suitable for the types of items in the different management groupings. Some of the prime characteristics which form the basis for categorization are the unit price of the item or its periodic demand value, demand frequency, the reparability of the item, and other characteristics of the item (such as end item versus repair part). Tailored to these characteristics and to the resulting management categories, a wide range of management methods are employed which directly affect the depth and breadth of stocks.

Assets applied to computations for one category are only those under depot control while another category requires the application of world-wide assets. At almost every ICP visited, the thoroughness of the review of computations is related to the management category. The method of computation ranged from a machine-performed operation in one category to a manually-generated product in another category. One ICP visited had five computational methods which were applied in accordance with the management categorization of the item involved.

Only one of the six ICPs visited deviated from a pattern of using demand value or unit price, or a combination of both, as the basis for a principal management category segmentation. The ICP which deviated included high dollar value as one of nine varying characteristics based on item peculiarities which determine the items which cannot be managed solely on a "recurring demand" basis and/or on a "by exception" basis.

Variables among the five ICPs using dollar value as a primary determinate factor included the use of (1) annual demand value, (2) unit price or, (3) a combination of both. Another variable was the designation of the highest dollar segment of management categorization which varied between groupings with an annual demand value "floor" of \$4,500 to a category with a "floor" of \$40,000.

Two of the ICPs operating under policy guidance of the same higher headquarters indicated that, effective July 1, 1965, the policy called for the following categorization: low dollar demand - \$0 to \$400; medium dollar demand - \$400.01 to \$4,500; high dollar demand - over \$4,500. A fourth category, "VIP," was designated for items having particularly erratic demand with "no demand prediction capability". One of these ICPs was using the

following breakout prior to the policy change: low dollar demand - \$0 to \$1400, medium dollar demand - \$1400.01 to \$10,000 and high dollar demand - over \$10,000.

Another ICP used a four position breakout predicated on annual demand value as follows: low dollar value - \$.01 to \$2,500; medium dollar value - \$2,500.01 to \$25,000; high dollar value - over \$25,000 and super-high dollar value - over \$25,000 and selected for intensive management.

One ICP considered the characteristics of demand value and reparability, and subdivided reparable items into three categories - repair parts, spares and equipments.

All of the ICPs visited had other criteria for categorization. One ICP combined demand frequency with the value groupings. Items having in excess of 20 demands a year were considered fast movers while those having less than 20 demands but more than one were considered slow movers. Other categories involved were "insurance", "provisioning", "special", "unstratified", etc.

One ICP had developed a generic grouping of items which included all like items of the full size range, and their substitute and interchangeable items, into one management grouping.

Still another ICP appeared to place emphasis on a categorization of the items based on the identification of the organizations within the ICP to which item management is assigned.

Several of the ICPs were found to be using a selective item management coding system which appears to stem directly from the supply status code directed by page 4 to chapter 6, Federal Manual for Supply Cataloging. The

ICP which did not emphasize demand dollar value placed considerable reliance on this codification for its major management breakout. Other ICPs used it in varying degrees. This coding system involves factors such as: fixed stock levels; reparable items with stock levels based on repair cycle requirements and washout rates; deteriorative nature; requirement for ICP approval prior to issue; seasonal items requiring scheduled procurement; and items issued as kits, sets, chests and assemblies.

Several other management coding approaches were observed at the ICPs visited. These were not common among the ICPs or were used in such a minor way that they were not considered of sufficient importance to warrant mention in this report.

C. Conclusions.

Although problems exist in the area of categorizing items for centralized versus decentralized management, dealt with in DoD Instruction 4140.7, efforts are currently underway to make improvements in this area. The working group, therefore, confined itself to problems involved in the categorization of items for management at the ICP level after the determination has been made that they are subject to centralized management.

Review of the item management classification problem at ICP level during this study reveals that there has been no substantial change in the problem as described in the report of the Materiel Management Data Systems Study Group, OASD(I&L), dated November 1962 and published under the title, "Responsive Automated Materiel Management System 1968 (RAMMS 68)." OSD policy for the categorization of items for management purposes is required as a first step if comparable management attention is to be given comparable items at all ICPs.

It is noted that the RAMMS study did offer a detailed viewpoint which could serve as a point of departure for further study and ultimate resolution.

SUPPLY EFFECTIVENESS MEASUREMENT AND ANALYSIS

A. Existing DoD Policy

There is virtually no DoD-wide policy guidance dealing with supply effectiveness measurement and analysis. DoD Directive 5105.22, November 1, 1963 (revision), subject: "Defense Supply Agency (DSA)," in paragraph VI. "FUNCTIONS," under subparagraph E, "Systems Analysis and Design," states: "4. Review and evaluate the operation of the supply and service systems assigned to DSA and make changes as required to improve the effectiveness of operations." While this guidance is addressed to DSA, no comparable guidance to the Military Departments was noted. However, the Services and DSA are constantly reviewing their supply systems to improve the effectiveness of the operation, as can be attested by the next generation systems under development.

Further guidance from OSD on the performance evaluation of a segment of the supply system will be forthcoming in the immediate future through the implementation of the Military Supply and Transportation Evaluation Procedures (MILSTEP). "These procedures will produce uniform defense-wide logistics performance measurement reports to be used in achieving the following objectives:

1. Establishment and revision of the UMMIPS time standards.
2. Evaluation of performance against established UMMIPS time standards.
3. Establishment of performance reports to provide for point-to-point reporting by shipping activity and carrier performance by carrier.
4. Evaluation of performance of each segment of the transportation pipeline.

5. Determination of supply systems workload and materiel availability.
6. Provide transportation planning guideline.
7. Provide the basis for traffic pattern analysis."

As can be noted from the above objectives, this procedure deals more with transportation evaluation than supply evaluation and will provide only a small segment of the total supply performance evaluation in being today. However, it does illustrate the feasibility of expanding existing systems, in this case MILSTRIP and MILSTAMP, to provide a standard evaluation system. MILSTEP is applicable to "stocked" items only and is scheduled for phased implementation with one phase becoming effective January 1, 1966, and full implementation July 1, 1966. This procedure will provide OSD, the Services and DSA with reports for comparison purposes and will permit the establishment of more realistically established processing time standards within the supply system.

B. Problem Description

ICPs within all of the Services and DSA collect and analyze various types of data relating to (1) supply performance measurement and analysis, (2) workload measurement analysis, (3) inventory condition profile, and (4) supply performance cost. Their purpose is to measure performance against goals or standards, identify areas where improvements have been made or are needed, and provide personnel incentive.

Supply performance measurement and analysis

All of the ICPs have been provided some guidance by the Services and DSA concerning performance measurement indicators, reporting frequency and format, and the goals or standards for evaluating performance. Performance measurement methods in use generally fall into two categories:

1. End item support

ICPs and Services providing supply support for aircraft, missiles, and certain other major end items and systems use, as a principal indicator of the degree of supply support, data on the operational readiness of the end items or, more accurately, data indicating the extent to which these end items are not ready to operate due to lack of needed materiel. The terms and measurement methods used vary among the headquarters agencies and ICPs; as a result, it is difficult to make meaningful comparisons among the Services with respect to such indices as aircraft out of commission for lack of parts. In addition, the goals or standards to which performance data are related differ among these organizations and appear to be set arbitrarily.

2. Supply system responsiveness

Apart from measuring degree of support for particular end items, all of the ICPs employ data and techniques to measure how well their segments of the supply system respond to demands placed on them. Some are such direct measurements as the percent of requisitions resulting in on-time shipments, and the percent resulting in delayed shipments (back orders). Some indirect measurements, indicating the

potential ability of the supply system to respond, include the number of items in an out-of-stock position, the rate of warehouse refusals, and comparisons of procurements for stock replenishment versus for direct delivery to requisitioners.

A basic difference was noted in the effectiveness evaluation approaches under conditions of appropriation funding and stock funding. Stock funding appears to place more emphasis on the relationship of projected sales and realized sales. Appropriation funding appears to place more emphasis on percent of on-time actions with little or no emphasis being placed on the cost of achieving a high on-time fill rate.

The Services, DSA and individual ICPs have established goals for supply system responsiveness. Most of these goals relate to such performance measurements as the percent of shipments made within the time standards prescribed. Two of the headquarters agencies have set this goal at 85% while another has pegged it at 96%. Another Service did not have an established goal in this area at the time of the visit of the working group but it is understood a goal has since been established. The working group found no scientific approach to the establishment of goals. One headquarters indicated it used the average of the three best ICPs as the goal for the next month. Some indicated they are "commander established" and others indicated gradual raising of the goals as ICPs begin to meet them to "keep the sights high." At best the goals seem to be arbitrary and sometimes based on no more than the conviction of some one with the authority to make the decision.

Headquarters and field personnel commented on a number of problems inherent in the measurement of supply system responsiveness. One area of difficulty is the relationship of partial fill to total fill on replenishment requisitions. None of the Services/Agency appear to have gone beyond an approach that no credit for on-time fill can be taken for a partial quantity.

Some of the managers felt that performance criteria should recognize a difference between response to stock replenishment requisitions for a quantity sufficient to last over a long period and response to an out-of-stock requisition for a quantity of one where the requisitioner was holding a due out to the ultimate user.

Another area of concern was how to deal with the required delivery date, either as specified on the requisition or as derived from time standards, versus the processing times prescribed in measuring responsiveness.

Still another subject which aroused considerable debate was the criteria for analyzing supply performance in connection with requisitions due out. There are four schools of thought on this matter. One viewpoint is that the number of stock numbers upon which there are back orders is the proper criterion. Another is that back order magnitude should be reflected in dollar terms. A third opinion is that the number of requisitions involved, regardless of the number of stock numbers or their dollar value, should be the basis for measurement. Another position is that the number of pieces on back order should serve as the proper indicator.

Another area subject to much discussion was the measurement of performance for "not stocked" items as contrasted to existing measurement of "stocked" items. Since there is no DoD policy relating to the basis for stocking items, performance can be raised by ICP election not to stock items subject to infrequent or sporadic demand. Prescribed policy for processing times covers only stocked items so most performance reporting is confined to those items. There is little effort made by the Services, DSA or the ICPs to evaluate performance on not-stocked items. One Service indicates this is a serious omission which precludes the establishment of realistic lead times for these items.

Another point of contention was the lumping of high management intensity items with the low management intensity items for performance determination. It was contended that low availability of items accorded only "exception" management counted as much against an ICP as did the low availability of high management intensity items. The ICP commander who raised this point felt that he required an evaluation system which would judge his performance on items in relation to the higher headquarters policy for their management.

Workload measurement and analysis

All ICPs/Services have reporting techniques designed to measure workload and/or provide the basis for the determination of performance measurement. For example, total requisitions processed is a workload factor and it is also the basis for determining performance in arriving at the percent of requisitions filled on time, back ordered,

rejected, suspended, etc. Other examples of data collected in this category are: number of item studies, number of procurement requests computed, number of receipts and issues, counts of catalog actions, materiel release orders, direct delivery orders, back orders, requisitions in work, suspended requisitions, issues by priority groups, rejects, etc. These reports may be expressed in pieces, stock number items, tons, dollar value, etc., as appropriate, and in some cases may be reported under several breakouts such as issues by tons, dollar value, item count, etc.

It was noted by the working group that the workload measurement reports were used with varying degrees of intensity and success for the determination of day-to-day work force allocation and long-range staffing. There was little use of these data in equating performance achieved to the cost of attaining that level of performance. Most of the workload reporting systems viewed were not in sufficient depth or detail to provide all of the costs involved in achieving a given degree of performance proficiency and at best provided only a basis for broad comparison of work volume with operating costs.

Inventory condition profile

All Services, DSA and ICPs utilize, for all types of items, other evaluation devices designed to reflect the condition of the inventory and stock control. Examples are periodic reports which indicate: new item growth, long supply and reportable excess items, inactive items, asset status change, reasons for item studies, reparable generation and return, inventory accuracy, materiel release/warehouse refusals, etc. Some of the above elements are reported in the terms

of line item count. Others are reported as dollar value and some have both count and value assessments.

Supply performance cost

There was little evidence of any activity employing techniques which permit an assessment of the cost of attaining any degree of support effectiveness or inventory condition. Most activities evaluate the manpower cost, space (office and warehouse) cost, EDPE rental, inventory investment, etc., and some headquarters compare one ICP against others in these respects. The techniques employed, however, permit only a sketchy relationship between cost and performance and no evidence was seen of any application of methods which produce a direct relationship between the cost of variations in depth and breadth of inventory and support effectiveness.

This same observation was made to the working group by a representative of Bureau of the Budget. In pointing out the need to tie the effectiveness rate to a cost to attain that rate, he used the example of an ICP with an excellent weapons operational rate but which tied up many years of inventory and caused not-operationally-ready conditions in other parts of the world. This same individual pointed out a tendency of management to give the most attention to the actual performance rate (at rating time) rather than to performance trends.

Along the same line a representative of OSD(Comp)(Budget) pointed out that one budget reviewer's performance standard is how much materiel goes excess, while the inventory manager's performance standard is how often he has a not-in-stock condition.

Use of reports

Publications of compiled statistics, and presentations to top management at ICPs and Service/Agency headquarters, are common results of the collection of data on performance measurement, workload and condition of the inventory.

The most common method is by the use of published reports. These vary in both frequency and content. One Service produces, semi-annually, a volume of some 500 pages under the title "Inventory Control Operations at Supply Distribution Activities." This document reflects a Service compilation of performance and workload count for all of its ICPs. Another Service produces a monthly publication entitled "Management Yardsticks" which includes some 26 graphic presentations and the supporting description for the past fiscal year and the months to date in the current fiscal year. Another publishes a monthly report of some 120 pages titled "Summary Management Data Report." This report covers both summary data for all ICPs as well as data on the individual ICP statistics, and is on a current year basis with some areas indicating two previous fiscal year summaries with the current fiscal year figures on a monthly basis.

Illustrated oral presentations to top management are a common product of the reporting system. These vary in content but most are on a monthly basis. Most of the presentations are based on parts of the monthly publications with viewgraph illustrations representing pages of the publication used as the briefing method. Most ICP

commanders maintain the same charts of their internal operation as the Service/Agency prescribes for its top management presentations and publications.

In two instances noted, the performance data reported to the headquarters by the ICPs is utilized at the higher headquarters to develop the "score" in an ICP performance contest.

In one case the headquarters rated its ICPs in each of some 20-25 performance elements reported and published these ratings. These performance elements are designed to indicate weapon operational readiness, materiel availability and condition of the inventory. In this instance little consideration was given to the cost to the winning ICP of attaining the winning score.

In the other case the headquarters selects and publicizes the "Top Three" ICPs. The "Top Three" selection is based on a combination of three factors; workload - which equates to volume of transactions, etc.; resources - which represent manpower, money and space; and effectiveness - which is materiel availability within stipulated time periods. The "Top Three" are published in alphabetical order so that the "winner" is known only to the selection group.

The working group noted the necessity for reporting the same information in several ways. In most instances this is based on the level to which the report is addressed and the degree of summary or detail desired. This was illustrated at one ICP visited which produces three periodic performance type reports, each for a different management level. One monthly publication is titled "Command Indices."

Its purpose is to present trend indicators relative to command operations to be used by staff and operating officials as a means of evaluating trends and measuring the degree of attainment of established goals. The same ICP produced a quarterly publication titled ". . . Review and Analysis Second Quarter FY 1965." Its twofold purpose was stated to be: (1) to provide concise summation of significant accomplishments, to aid staff and operating officials in measuring the degree of attainment of established goals, and (2) to furnish a synopsis of activities of this command for the interest of other personnel. The third publication was titled "Statistical Reference Book." It was published monthly as a presentation of statistical data covering the major functional areas of the various directorates and offices within the command. It is intended to serve as a management tool for directors/office chiefs and their personnel in evaluating accomplishments of their particular work areas as compared to others in the command.

C. Conclusion

Despite lack of DoD-wide policy on the measurement and analysis of supply effectiveness, systems and techniques for this purpose are obviously needed, and various approaches previously described are employed by the ICPs and their headquarters agencies. The systems in use involve great amounts of data in assortments which vary from one organization to the next. This raises questions concerning (1) the minimum amount and variety of data required to serve this purpose, and (2) a practical means to aggregate and evaluate masses

of differing types of data (responsiveness to requisitions, manpower employed, inventory investment, number of items managed, ad infinitum).

On a less general note, we observe an emphasis on measuring and reacting to indicators of relative success or failure in performing the supply support mission (percentage of requisitions filled on time, etc.). It should be stressed that there are no "standards" recognized DoD-wide (such as "85% of all requisitioned quantities supplied on time") which stand for "successful" supply support performance. This does not suggest that any such single standard (e.g., 85%) would be feasible or appropriate for all groupings of items, recognizing differences in such factors as essentiality and cost. However, the complete lack of either DoD-wide specific supply performance standards or even general guidance along this line leaves a vacuum which is filled by more or less arbitrarily established "goals" which vary from one Service/Agency/ICP to the next.

In contrast to the emphasis on performance measurement, there is less emphasis on measuring and reacting to indicators of supply support costs (inventory investment, manpower, EDPE, facilities, etc.). Along this line, for example, the relative size of the staff, from one ICP to the next, is not tied to any indices recognized DoD-wide (such as number of items managed, size of procurement program, etc.), nor to any "standards" relating to such indices.

Considering the extreme importance of the supply support job which the Services and DSA have to do and the massive investment in resources which has been made to enable that job to be done, it appears to be a

... and fundamental omission that there are neither DoD-wide recognized systems nor standards for judging, on a comparable basis throughout the Department of Defense, how effectively and how economically the job is being performed.

This is scarcely a unique observation on our part. The long-standing and intense interest in this problem is illustrated by the attention given to "measurement of logistics performance/effectiveness" during the Logistics Research Conference held in May of this year. Of nine working panels, one was fully engaged in this subject. The panel's report is clear and strong evidence that we still require straightforward answers to the most basic questions in this area. For example, in describing "problem areas and techniques for solution," the panel's first statement was "One of the most important areas was that of identifying logistics systems objectives." This, perhaps, is the most critical feature of evaluating logistics performance/effectiveness . . . we must carefully define what the system is supposed to do."

One of the speakers who addressed the Conference spotlighted the performance/effectiveness measurement area in the following statement:

"Our studies have confirmed the feasibility of maintaining at the headquarters an up-to-date data bank of summary information which can be retrieved on a situation or exception basis. Required data elements are now being identified, cataloged and defined in a manner which will assure thorough compatibility among workload

projections, operating goals, performance standards, manpower and budget requirements, and after-the-fact accounting for manpower, cost and performance. This is a big order. I look forward also to the day when we will have, throughout the DoD, a commonly accepted formula for evaluating logistic effectiveness and efficiency. Our management information system will be much more valuable when it can measure performance against standard criteria."

While this problem area is more complex than most discussed in this report, its fundamental nature and importance demand that every reasonable means be used to coordinate and expedite current efforts on this subject, and produce practical and uniform DoD-wide guidance.

ICP ASSET KNOWLEDGE AND CONTROL

A. Existing DoD Policy

DoD Instruction 4140.1, October 12, 1956, subject: "Inventory Management Policy," paragraph IV D states:

"Each inventory control point shall maintain a world-wide inventory of all items under its cognizance. For those items which are not included in periodic inventory status reports on a quantitative basis, reports will be made to and data maintained by the inventory control point in such monetary terms and groupings, and upon such frequency, as necessary to assure sound evaluation and control of inventory. Each inventory control point shall extend its reporting control over selected items of materiel under its cognizance to include those items and quantities which are within tactical operational commands and in the hands of users in accordance with the instructions contained in Reference (d)."

The latter reference is DoD Directive 4140.9, "Inventory Management Report for Materiel in the Military Supply Systems." That Directive was cancelled on July 8, 1963, by DoD Instruction 4140.18, "Management and Transaction Reports for Appropriation-Financed Materiel." The latter alludes to a policy regarding depth of asset knowledge and control in prescribing in Paragraph IV that "status reports for appropriation-financed principal items will include world-wide assets in use." Similarly, in defining "principal items" in Inclosure 2, Paragraph II, DoD Instruction 4140.18 refers to a need for "central knowledge and control of all assets owned by the military service or Defense agency."

As can be seen, these DoD directives give only very general guidance concerning ICP depth of asset knowledge and no clearcut guidance on ICP control of assets at the various supply and operating echelons.

B. Problem Description.

Systems used today to maintain ICP knowledge of assets at various echelons and to control those assets vary considerably from one ICP to the next.

Four of the ICPs visited have transaction-by-transaction knowledge of the status of all assets, by location and condition, within their "wholesale" distribution systems. This up-to-date asset knowledge is a product of the requisition processing system employed by these ICPs: centralized ICP processing of all materiel requisitions placed on the wholesale distribution system.

The other two ICPs receive transaction reports from wholesale system storage and distribution points to which customer requisitions are addressed. One of these ICPs indicated that the addition of inventory balance information, with the implementation of MILSTRAP, would provide it with improved asset validation procedures. The other ICP stated that, upon implementation of its next generation inventory management system, it will become the central point for receipt of requisitions, and will maintain storage point balances and prepare shipping orders to the appropriate storage point.

The foregoing relates to knowledge and control of assets within the wholesale systems.

Most of the ICPs visited have some form of periodic report of assets from activities below the normal wholesale or reporting system. These reports

are for the high management intensity segment of the inventory and vary from continuous reporting of inventory changes, by serial number, to periodic reporting of past consumption and current balance information. The segment of the inventory involved in this type reporting is generally confined to the high dollar value items which are subject to repair. Another segment frequently reported in this depth is "equipment" items in the hands of units where use is typically authorized by allowance documents.

All of the ICPs visited have some form of financial inventory reporting which covers the dollar value of the total inventory held by those activities obliged to render such reports.

Trends toward more complete asset knowledge below the wholesale level were noted both in the systems in use today and in those which are scheduled for next generation implementation. Several of the ICPs visited pointed out the advantages of existing high value reparable item asset knowledge obtained from existing systems, and most of the next-generation systems include plans for centralized asset knowledge of some range of the inventory. The items considered for centralized knowledge in the next generation systems vary from ICP to ICP, but the range is generally indicated to be in the high and medium dollar value area. ICP knowledge of the asset position will result from transaction reporting under MILSTRAP criteria.

Even after obtaining the objective of increased knowledge of assets below the wholesale level, complications will continue to exist in ICP control of those assets due to the command or local "ownership" of stocks which are within the authorized levels established for those activities. Even where stock funding and reimbursement is not involved and materiel is

issued "free" from ICP wholesale stocks, under some of the systems in use today those lower echelons view themselves as "owners" of those item quantities. Such assets are not routinely available to other requiring units via the ICP unless the current "owner" reports item quantities available as excess to its needs. Under stock funding, the local unit is responsible for the funds to acquire the inventory from the wholesale system, there is also a financial argument for the local "ownership" viewpoint.

C. Conclusions.

It would appear that any of the various approaches to both asset knowledge and asset control viewed at the ICPs visited are within the bounds of the current, extremely general OSD policy guidance. The wide variety of applications of the policy regarding asset knowledge suggest need for clarification. The possibility of improved customer support and maximum utilization of assets through increased ICP knowledge and control of assets below the wholesale level, coupled with indications that next generation systems are headed in this direction, gives additional credence to the need for OSD policy in this area.

DoD-wide policy guidance must be specific concerning the authority and responsibility for ICPs obtaining and maintaining data on assets in various supply and operating echelons within and below the wholesale system.

DoD policy regarding the authority of ICPs to direct redistribution of assets at echelons below the wholesale level should be stated. Specific criteria, such as item dollar value, item essentiality and supply operating

conditions, which guide decisions concerning the items for which the ICP will exercise the authority and the circumstances under which the authority will be exercised, must be made a part of the policy.

USE RATE FACTORS AND DEMAND FORECASTING

A. Existing DoD Policy

DoD Instruction 3232.4, April 2, 1956, subject: "Policy and Principles Governing Provisioning of End Items of Materiel," provides limited guidance in the establishment of projected use rate factors for provisioning requirement computations. This Instruction states that one of the DoD provisioning objectives is that usage information developed during design and test stages will be made available to personnel responsible for the selection of items required for maintenance support. The Instruction also provides that obligation may be placed on contractors to furnish requirements recommendations, implicitly necessitating contractor projection of use rates in such cases.

c) Current DoD policy includes several terms which relate to the rate at which item assets are requested or used, which bears on replenishment requirements. DoD Instruction 4140.4, September 3, 1954, subject: "Management of the Materiel Pipeline, Including Levels of Supply," speaks of the "average rate of replenishable demands." DoD Instruction 4140.11, June 24, 1958, subject: "Peacetime Operating and Safety Levels of Supply," uses the term "repetitive demand" in several places and, in describing the factors involved in a formula, states that "A is the annual value of demand in dollars." The same directive also uses the term "anticipated replenishable demands."

DoD Instruction 5000.8, June 15, 1961, subject: "Glossary of Terms Used in Areas of Financial, Supply and Installation Management," carries the following definitions relating to the above:

Issues, Nonrecurring. An issue made on a one-time basis with no foreseeable subsequent demand from the requisitioner.

Recurring Demand. A request made periodically or anticipated to be repetitive by an authorized requisitioner for materiel for consumption or use or for stock replenishment.

Nonrecurring Demand. A request made by an authorized customer on a "one-time" basis to provide initial or authorized increases in allowances or stockage at any level, or for modification of equipment, special planned programs, and one-time repair or rebuild requirements.

DoD 4140.17-M, the instruction manual for MILSTRIP, states: "the demand code is a mandatory one-digit alphabetical character to indicate to the management element of a distribution system whether the demand is recurring or nonrecurring." Codes and their descriptions from this manual are:

Code P. Nonrecurring Demand for Special Program Requirements. A demand made on a one-time basis to satisfy special program requirements (SPR). This code will be entered in requisitions for SPR when such requirements have been previously identified and made known to the responsible Inventory Manager of the supplying Military Service or Agency.

Code R. Recurring Demand. A demand to replenish materiel utilized on a day-to-day basis.

Code N. Nonrecurring Demand. A demand made on a "one-time" basis. Normally to provide initial stockage allowances, meet planned program demands, and to meet one-time projects or maintenance requirements.

Code O. No Demand. To be assigned by requisitioning activities in submitting requisitions for substitute items which are acceptable in lieu of previously requisitioned, but delayed items.

Code S. Commissary Resale Items. (Not applicable to this discussion.)

DoD Instruction 4140 24, September 10, 1964, subject: "Requirements Priority and Asset Application for Secondary Items," paragraph V 9, in defining issue requirements, states: "The estimated demands for issues of the items during the apportionment year, exclusive of those shown as stock due-out. The following breakdown will be provided: (a) recurring and (b) nonrecurring."

B. Problem Description

1. Use rate factors, initial provisioning

Projected use factors employed in provisioning (e.g., replacement factor, failure factor, mean time to removal) are normally a function of anticipated use over a specific period in relationship to a program element, such as flying hours, overhauls, population. It was apparent from our visit that a wide variance exists within the DoD, both in the methods and information sources employed in establishing these projected use rates.

At two ICPs visited almost complete reliance was placed on the recommendation of the contractor. Review of these recommendations

for subsequent change, based on either individual technician's judgment or experience with similar items, was generally limited to high dollar value items. In some instances projected replacement rates of relatively high cost reparable items were arbitrarily set by stock analysts as a percentage of mandatory change times established by technicians.

At another ICP, replacement factor "look up" tables were used by technical personnel having the responsibility for assigning projected use rates. The tables had differing factor values assigned to generic item groupings and, where appropriate, to item sizes, tolerances, RPM ratings and other measurement elements within the generic item groupings. While contractor recommendations and usage during test and evaluation were available in some instances, almost complete reliance was placed on the values in the tables. Although apparently based on historical experience, no controlled or timely program or procedures for reviewing or updating the table values was evident.

Still another ICP, while obtaining contractor recommendations, placed the greatest reliance on a machine program which averaged actual system demand for similar items for similar equipments to arrive at projected use rates for provisioning computations. This program has the advantage of furnishing to the provisioner information on current demand being experienced on similar items. One disadvantage is reliance on "issue" information as "usage" information.

2. Use rate factors and demand forecasting, replenishment requirements

There is a wide disparity among the ICPs visited regarding interpretation of the demand information provided by the MILSTRIP requisition and use of this data in requirement computations.

One ICP receives reports each 15 days of recurring demands only. Any requisition received which is not "R" coded is not reported to the ICP; hence, all other (nonreported) demands are assumed to be nonrecurring and are not considered in computing supply levels. The next generation system, which this ICP will adopt in the near future, will provide ICP knowledge of all codes. This ICP stated that field coding is relatively reliable and, although the item managers can challenge field coding, little of this is done.

By contrast, another ICP has all of the MILSTRIP codes available at the time of computation and, as a policy matter, considers requisitions with a blank in column 44 as nonrecurring demands. Here the view was expressed that the field is not very reliable in interpreting the MILSTRIP guidance. This ICP stated that its item managers change the demand history on between 5% and 10% of the items during the course of manual computations or review of machine computations.

Another ICP, which has a low volume of demand-based items, uses both the "R" and "N" codes as representing recurring service demands. "P" and " " coded requisitions are not considered recurring. Item managers at this ICP have the authority to change demand history.

Still another ICP feels that the responsibility for proper coding rests with the customer and generally accepts the codes submitted. In a selective management procedure, item managers review the demand factor for high dollar value items only.

The remaining two ICPs indicated that coding by the customer is not acceptable and, in both instances, item managers have the

responsibility for deciding the relative value of recurring and non-recurring demand information accumulated.

Disparity among the ICPs was also seen in the ways they forecast future demands. Some of the problems related to application of the demand data are reflected in the following:

One ICP has five methods of making demand forecasts. Three methods are used for reparable items (average quarterly demand, average quarterly return, and the mean time between removals). The method to be used in a computation is selected by the item manager. Data is collected over a 24 month base period to provide quarterly averages. For nonreparable items, this ICP has two methods - one for low dollar value items, and another for medium and high dollar value items. The low dollar value item basis is gross demand (total issues). For medium and high dollar value items, the ICP uses the recurring demands as indicated by field coding in requisitions, reviewed and adjusted by the item manager. The reviewed and adjusted demand is termed "selective demand."

Another ICP has two methods of determining the use rate. The ICP issue rate is applied to items which are defined as "repair parts" and for which requirements are computed on an EOQ basis. The ICP issue rate is derived from four years actual replacement issue history but is subject to modification by the manager. For example, when the four year experience indicates a rapidly descending issue trend, policy states that the item will be recomputed using the past one year's issue experience as the base period. For the range of

items termed "spares," this ICP bases the usage rate on item failures that require replacement. This rate is tailored by the manager on an item basis considering item characteristics, failure pattern analysis or reliability forecast, and experience on comparable items.

The third ICP uses a demand-based system utilizing trend extrapolation. It was noted that this ICP produces a computer report of a comparison of forecast demands with actual demands on a weekly basis for management analysis.

Another ICP utilizes recurring demand information but employs a weighting technique to give more emphasis to recent months. The next generation system to be employed by this ICP will introduce the use of a tracking signal in recurring demand computations.

The remaining two ICPs illustrate the wide range of approaches used. One ICP utilizes a set of complex mathematical techniques employing single or double smoothing, shifted as trends change; different factors for fast, slow and insurance items; demand filtering, etc. The other uses unweighted, field-indicated recurring demand over the last twelve months, permits item managers to change machine results, and plans to use a double smoothing technique in its next generation system.

C. Conclusion

Projected use rate factors are the common denominator in determination of all stock levels computed during the provisioning process. The relative correctness of this projected factor has the greatest bearing on either the understatement of requirements with its

subsequent impact on effective support, or the overstatement of requirements and related cost effects. It follows that all valid elements of intelligence relating to projecting this factor should be used.

A detailed review of all methods presently used in the DoD for projecting use rates in the provisioning process should be conducted toward development of DoD-wide policy in this area. Particular attention should be applied to:

1. Methods used, including currency and completeness of information.
2. Actual usage compared to rates projected.
3. Degree of reliance which should be placed on contractor recommendations.
4. Degree of reliance which should be placed on past experience and the need for controlled programs and procedures to provide this information to provisioners.

While the working group did not have an opportunity to discuss demand data with the field level at which requisitions are generated and the initial demand coding done, the reports from the ICPs visited indicate the existence of a serious problem. Conclusions regarding the interpretation of demand data provided by the MILSTRIP codes entered by requisitioning activities are:

OSD definitions, policy guidance and the MILSTRIP demand code definitions should be aligned to eliminate any question

regarding their interpretation. The policy should be enlarged to relate the MILSTRIP codes in their exact terms to the factors involved in requirement computations. Coupled with improved definitions, policy guidance should be sufficiently detailed to permit machine selection of the exact demands to be employed in computing requirements. The guidance should also specify criteria under which item managers are authorized to modify collected data.

The process of forecasting future demand rates needs the following effort:

OSD policy should be expressed concerning the forecasting of future use rates. Guidance should cover such aspects as the length of the base period, with criteria for selection of longer or shorter periods, or the use of indefinite length history; the weighting of the history as in exponential smoothing; application to reparable and consumables, etc. There should also be policy expression concerning preference for mathematical techniques which place varying emphasis on information based on its age, provide trend forecasts, signal questionable data, apply factors related to the frequency of movement of the item, etc. In this connection, it is pointed out that all of the next generation systems discussed in the course of this study include plans to use complex mathematical techniques which vary as widely as the techniques employed today.

PROCUREMENT LEAD TIME FACTORS

A. Existing DoD Policy.

Procurement lead time is defined in DoD Instruction 5000.8, June 15, 1961, subject: "Glossary of Terms Used in the Areas of Finance, Supply and Installation Management", as the "time interval between the initiation of procurement action and the receipt into the supply system of materiel purchased as a result of such action. It is applicable to materiel to be obtained from any source outside the procuring department or by manufacture within the department. It is composed of two principal elements, administrative lead-time and production lead-time."

Administrative lead time is defined in the same document as the "time interval between initiation of procurement action and letting of a contract or placing of an order."

Production lead time is defined in the same document as the "time interval between the placement of a contract and receipt into the supply system of materiel acquired."

DoD Instruction 4140.20, August 26, 1963, subject: "Base Supply Levels of Repairable Type Items", makes reference to a related factor - order and shipping time. This is defined substantially the same as the DoD Instruction 5000.8 definition of procurement lead time except that 4140.20 confines its applicability "only to materiel within the supply system...." and segments order and shipping time into order time and shipping time.

B. Problem Description.

1. Lead Time, Initial Provisioning.

Procurement lead time factors used in computation of initial provisioning requirements generally include production lead time segments and, in some

cases, added fixed administrative lead time segments. From ICPs visited it can generally be stated that (a) use of fixed production lead times for rather broad generic or management categories is the rule rather than the exception and (b) production lead times used are based on the concept that items will be out of production at the time replenishment is required. There was no evidence of consideration of the fact that the same items are, in some cases, planned for multi-year production, due to multi-year end item procurement. Accordingly, they should be available, during the period for which provisioning support is being computed, on a shorter procurement lead time than one predicated on a "cold base".

Of the four ICPs visited which compute provisioning requirements, two use the sum of a variable production lead time and a fixed administrative lead time in determining procurement lead time. An attempt is made to determine actual production lead time but generally the lead time is assigned to broad categories of items in lieu of individual items.

Another ICF used production lead time only. Here again, this was generally based on broad, generic item categories.

Still another ICF used a fixed procurement lead time for all items in certain management categories with no definition of what lead time segments were included. This was established at six months for one management category and twelve months for another. Instructions required that actual lead times be used, if they could be ascertained. For these two management categories, it was noted that a single item could have either a six or twelve month lead time assigned, depending on the end item being provisioned. For other management categories, variable lead times were used but were generally based on broad generic groupings.

2. Lead Time, Replenishment Requirements.

Procurement lead time as defined in DoD Instruction 5000.8 does not include consideration of a considerable portion of the time which elapses between the time the item reaches a reorder condition and the time the firm quantity for procurement is passed from supply to procurement channels. Several of the ICPs visited termed this interval activity lead time. This period tends to be more extended for high dollar items than it does for low dollar items. Operating procedures in general use permit the passing of machine-computed low dollar buy quantities to procurement either automatically or after limited review, but typically require detailed review by management for high dollar buy quantities, with increased review intensity as the dollar value of the buy quantity increases.

When it was possible to isolate the factor of activity lead time at the ICPs visited, it was found to have the greatest percentage spread of any of the segments involved. The maximum activity lead times ranged from 10 days (with an average of 3 days) at one ICP to 4 months (with an average of 2 months) at another ICP. Since activity lead time involves the period between which the quantity of stock on hand reaches the replenishment point and the determination of an actual buy net quantity, the frequency with which computers do item studies is a determining factor. As the advanced systems which propose to do item studies on a "real time" basis are implemented, this portion of activity lead time will be reduced.

It was learned that most ICPs visited do not collect and use lead time data broken into the two segments referenced in the definition cited. Rather they tend to lump those two segments, plus activity lead time, into

one time period. This tendency precludes accurate determination of the sources and causes of delay between need to buy and receipt of the inventory. All ICFs visited indicated a need to collect lead time by segment and several will achieve this in the near future upon progression to the next generation of system design.

In instances in which the ICP is currently accumulating segmented time periods either under computer control or by off-line procedures, it was determined that circumstances tend to make establishment of a definite average time for each segment a rather unscientific undertaking. Factors contributing to wide variations were determined to be such things as (1) extended review periods to determine the accuracy of the net requirement when large dollar buys are involved, (2) extended review periods to determine the advisability of the investment when funds are short (as they were at the end of FY 1965 when several ICFs were visited), (3) extended negotiation time involved when production samples are required, (4) extended production time when government furnished materiel is involved but not available, and (5) distortions in historical data when abnormal administrative actions are taken and not compensated for in the data collection process.

A common variable was the collection of lead time data by FSN versus by supply class. It was noted that, in instances in which data is being collected by supply class, most ICFs indicated a need to have the information by FSN and in one instance indicated plans for the immediate future to convert to data collection by FSN. It was pointed out in this instance that the data will not be usable pending the collection of sufficient history to provide a firm base for lead time projection.

Another variable noted was the criterion used for judging when the end of the production period has been reached, for the purpose of measuring the production lead time segment. One ICP visited used "shipment of one half of the ordered quantity" as termination of the production period while another ICP used the "first normal delivery".

Equally as variable were the criteria for the use of past history of lead times. In one instance, only the last procurement was used, in another, the last three; while, in a third case, considerable history was collected with heaviest weight being given the most recent three procurements.

Two ICPs visited respectively used fixed and maximum administrative lead times. In both instances, 3 months was the time involved--used as a maximum by one ICP and as a fixed figure at another. In the instance of the ICP using 3 months as a maximum time, a study had been conducted and it was determined that of 50 items studied, 40 had an administrative lead time greater than 4 months.

In no case was it found that different lead times have been established based on unit cost or consumption dollar value. However, considerable evidence was found of the use of various contracting techniques which, among other things, have the effect of reducing the lead time on stable demand/high value items. Techniques such as variable quantity, on-call delivery, minimum/maximum quantity, multi-year, etc., contracts were used and it appears that the frequency of their use is increasing.

The greatest degree of commonality was found in the practice of "fixing" (or manually "setting") lead times. In most instances, and regardless of the manner in which the historical data is collected--by machine or

manually, by FSN or supply class--procedures were available for the item or class manager to introduce a new figure to override a computed time.

C. Conclusions.

Consideration should be given to the inclusion of the activity lead time segment in the DoD definitions and policies regarding lead time factors and their use in requirement computations. Action in this area is necessary if the actual time span is to be reflected in computations. Further, collection of activity lead time data would be useful in determining where delays occur during the full span of time between the transaction which creates the need and fulfillment of the need.

As an extension of the above, consideration should also be given to a change in the policy to require that procurement lead time data be collected in identifiable segments such as activity, administrative, and production lead times. With the trend toward accumulation of data by FSN rather than by FSC, collection in the three segments by item will permit management effort to reduce the lead time in the items having the greatest dollar payoff. This management effort should include analysis of the use of various contract techniques which can be employed to reduce the lead time, and DoD policy should state the objectives regarding lead time reduction in each of the segments for high value procurements versus low value procurements to obtain the lowest lead time investment for the highest dollar segment.

A related problem concerns the point in time when procurement lead time should be judged to have ended. Uncertainty and inadequate guidance is evidenced by the use of ending points which could vary by 3 to 6 months at the ICPS visited.

Policy guidance should be provided with respect to computation of procurement lead time factor values. Consideration should be given to such aspects as the number of procurements for which procurement lead time should be collected, how much emphasis should be placed on most recent procurements, and what recognition should be given to special attention or peculiar circumstances which shorten or increase the lead time. There is need for policy guidance regarding the conditions under which lead time can be fixed--manually set, overriding machine or other routine computations.

For new items entering military supply systems, where lead times are manually established, consideration should be given to providing guidance on (a) the use of individual item production lead times, based on item characteristics, versus fixed lead times for broad management or generic item categories and (b) use of "in production" lead times versus "out of production" lead times in cases where the end item production will continue through the period for which initial support is being computed.

INPUT FACTORS PECULIAR TO REPARABLE ITEM REQUIREMENTS (REPAIR CYCLE TIME, REPAIR RATE, ATTRITION RATE)

A. Existing DoD Policy

DoD Instruction 4140.20, August 26, 1963, subject: "Base Supply Levels of Reparable Type Items," provides the concept for establishing stock levels of reparable items at individual posts, camps, stations and bases, and lists the input factors to be used in establishing these levels. These factors include repair cycle time and repair rate.

Repair cycle time is defined as "the time normally required for an item to pass economically through the repair cycle, excluding any extraordinary awaiting parts delays and any intentional extended transit, storage or repair process delays." Repair cycle is defined as "all the unserviceable stages through which a reparable type item passes from the time of its maintenance replacement until it is restored to serviceable condition. The repair cycle includes such stages as: removed; awaiting shipment; in transit; in pre-repair screening; in process of repair; and return to serviceable stock."

While DoD Instruction 4140.20 does not state a definition of repair rate, the Instruction indicates that the term represents "the anticipated number of maintenance replacements that will be repaired" This Instruction does not provide factors for use in determining system (depot, wholesale, etc.) requirements for centrally managed items.

DoD Instruction 4140.24, September 10, 1964, subject: "Requirements Priority and Asset Application for Secondary Items," while not providing input factors, per se, for computing reparable item stock levels, does establish approved requirements strata for reparable items and implies the factors upon which these strata will be based, i.e, maintenance replacement rate, recovery rate, and repair cycle time. This Instruction, however, is directly applicable to the stratification of existing inventories and its pertinence to day-to-day reparable item management would be by implication only. A repair cycle is defined for stratification purposes as "the average period of time between the pick-up on inventory control point records of an item in unserviceable condition and the restoration of that item to a ready-for-issue condition."

B. Problem Description

This problem is concerned with input factors which are peculiar to reparable items and applicable to system requirement computations. There are three separate factors in this category. These are:

1. Repair cycle time
2. Repair rate
3. Attrition rate.

Lacking definitive DoD policy for development and application of these factors for the management of reparable items at the system level, each Service or ICP has developed its own methods. There is a marked dissimilarity among them in factor identification, measurement and forecasting, both in methods used for new reparable items entering

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supply systems through the provisioning process and for established items.

Repair Cycle Time: At one ICP visited, variable projected repair cycle times were established for new items entering the master inventory record during provisioning. Subsequently, historical actual repair cycle times are maintained by a machine program and averaged periodically. This averaging, to establish a repair cycle time, includes total "repair-in-process" and "in transit" times for commercial or nonreporting activity overhaul, but only "repair-in-process" time for overhaul by reporting activities.

At another ICP reparable items were divided into two categories, those requiring mandatory removal and replacement after fixed time periods plus other selected high dollar value items, and those requiring removal based on condition only. Fixed repair cycles of 4 and 6 months respectively were used in requirement determinations, both for new and established items. More intensive management, including rapid transportation, was used for the former category. The repair cycle was defined as the time between the date of a supply control study resulting in repair action to the receipt of the first shipment in the supply system from such repair action.

At a third ICP a fixed repair cycle time of 6 months was being used for all reparable items entering the system through the provisioning process. Later variable repair cycles are entered in the inventory record for established reparable items based on experience. A new program for reparable item management is being implemented.

This program also provides for variable repair cycle times for replenishment requirement computations. These repair cycles will be measured from the time of issue of a serviceable item until the item which it replaces is returned to a serviceable condition.

At another ICP repair cycle times for both the depots and bases (users) were established for system management for both new items and established items. These were variable for depot repair and fixed at 10 days for bases. Repair cycle times were measured from the time of maintenance removal of the item until it was returned to a serviceable condition.

Repair Rate: A system repair rate is synonymous with a system recoverability rate. For most methods observed, "recoverability" was the measured factor used in system management.

At one ICP, the repair rate was designated as the "repairable return rate of ready for issue (RFI) from repair facility." This was expressed as a percentage of items inducted into repair which are returned to stock in a serviceable condition. The item repair induction rate is expressed as the percentage of failures of the item for which repair is beyond the capability of field maintenance and which are returned to the system for repair. These rates were projected by technicians for new items entering the inventory record through the provisioning process and were later revised by machine programs based on historical experience, with system demand representing failure rate.

At another ICP no repair rate, per se, was established but, in effect, the repair rate was the rate of return to the system of

unserviceable mandatory time change reparable items. For items replaced based on item condition, the repair rate, in effect, was the rate of return of unserviceable items less the experienced depot attrition rate. These return rates were established during item control studies by determining average quarterly demand and average quarterly returns over a past program element and applying the ratio of returns to forecast demand over a future program element. During provisioning computations no attrition was forecast so the repair rate anticipated equaled 100% of maintenance replacements forecast in item computations.

At another ICP, a system repair rate was developed for established items. This rate was based on the repair rate per month and was derived as a function of the average monthly demand and the average monthly washout quantity. No repair rate or recoverability rate was assigned for new items entering the system through the provisioning process.

At still another ICP, both base and depot reparable item factors enter into system requirement computations. Base repair rates are assigned for both new and established items. For new items 100% recoverability is normally projected until experience is gained. Therefore, the base repair rate for new items, expressed over a program segment, is the maintenance replacement rate less the rate of return to depots for repair. For established items, base attrition is also deducted from maintenance replacement to arrive at the base repair rate. No depot repair rate is assigned. However, a system wearout rate is developed and used in some computational methods.

This, together with total reparable generations provide a system recoverability (repair) rate.

Attrition Rate. The system attrition rate represents the number of reparable items, per time periods, determined to be beyond repair.

At one ICP observed, no system attrition rate was developed for direct use in computational formulas. Instead, the quarterly demand, anticipated or experienced, less the system recoverability rate, was used to represent attrition rate. This rate was developed for new items during the provisioning process but applied in operating level determinations only.

At another ICP, the attrition rate was similarly developed as an indirect function of the issue rate and the rate that the item was returned from repair in an issuable condition. These rates were all expressed as a rate per segment of program element. No attrition rate was used in determining requirements during the provisioning process, with 100% recoverability projected. Normally this 100% recoverability assumption was used in replenishment studies for the reparable items having mandatory change times.

System attrition rates were assigned by one ICP to all new and established items as a percentage of the average monthly recurring demand for the item.

Still another ICP computed system attrition rates as a percentage of reparable items replaced. This was based on the total of field maintenance and depot condemnations.

C. Conclusions

There is no definitive DoD policy for the identification, measurement and forecasting of input factors for use by wholesale managers in computing system requirements for reparable items.

There is a great dissimilarity in names, definitions, measurement methods, and numerical values now being used for reparable item management.

Problems in reparable item management have been evident for a long time; some of the difficulties we observed were addressed in the OASD(I&L) Aviation Materiel Management Improvement Program in 1962.

It would appear that progress toward full employment by item managers of appropriate reparable item factors with realistic factor values would be accelerated by more precise and uniform DoD guidance.

OPERATING LEVELS

A. Existing DoD Policy.

An operating level of supply is described in DoD Instruction 5000.8 as being the "quantity of materiel required to be on hand to meet replenishment issue demands during the interval between arrival of successive replenishment shipments".

The OSD policy statement on operating level, from DoD Instruction 4140.4, September 3, 1954, subject: "Management of the Materiel Pipeline, Including Levels of Supply", follows:

"The operating level of supply of each item or category for a distribution point will be equivalent to the average rate of replenishable issue demands of authorized support elements, times the normal interval between replenishment shipments. The normal interval between replenishment shipments must be expressed in a unit of time which is the same as that used to express the average rate of replenishable issue demands. The average demand rate should be based upon a period sufficiently long to give validity to the demand data sample."

The OSD policy statement from DoD Instruction 4140.11, June 21, 1958, subject: "Peacetime Operating and Safety Levels of Supply", follows:

"The objective of this Instruction is to provide for more effective and economical operating and safety levels of supply for these type of items (consumable) by utilizing:

"a. Economic order and procurement principles for the establishment and maintenance of optimum operating levels....

"III POLICY

"A. Operating Level of Supply

"1. It is the policy of the Department of Defense that operating levels and replenishment cycles, for each repetitive demand, consumable item, will be adjusted to that point where total variable costs of operation are minimized. This condition can generally be obtained by application of the economic order principle which attempts to equate the cost to order to the cost to hold. This principle may be expressed by the formula:

$$Q = \sqrt{\frac{2AC}{H}}$$

Where:

"Q is the economic order quantity in dollars
A is the annual value of demand in dollars
C is the cost to order in dollars, and
H is the cost to hold expressed as a percentage per year.

Exceptions to this policy will be permitted where (a) there are compelling military reasons; (b) deterioration, spillage or loss would result; (c) seasonal buys, economic production runs, unit back or industry delivery practices would dictate a different quantity; (d) storage space is unavailable; (e) procurement funds are not available.

"2. Elements of Cost

"(a) As a minimum, the cost to order will include but need not be limited to the following cost elements:

"Requirements review.

"Contract placement and administration, including inspection and acceptance.

"Applicable portions of stock control and financial control.

"Preparation, recording and submission of requirement requisitions and purchase requests.

"Control and documentation incident to shipment and receipt.

"(b) As a minimum, the cost to hold will include but need not be limited to the following cost elements:

"Interest on dollar inventory investment (which for purpose of this Instruction will be assumed to be 4 percent).

"Applicable stock control and financial control.

"Care and preservation.

"Storage.

"Physical inventory.

"Deterioration and shrinkage.

"Obsolescence.

"3. The operating level for centrally distributed stocks computed under this Instruction for central distribution points located within the continental United States will be based on total, system wide replenishable demands. Separately computed operating levels are authorized for overseas commands.

"4. The operating level computed under this Instruction for local distribution points, both in CONUS and overseas, will be based on anticipated replenishable demands at each local distribution point without regard to operating levels maintained at central distribution points.

"5. Each Military Department will determine the additional applicable costs to be included in the economic order quantity formula set forth in paragraph 1 above."

DoD Instruction 4140.20, August 26, 1963, subject: "Base Supply Levels of Reparable Type Items", is applicable to "reparable type items at individual posts, camps, stations, and bases". In paragraph IV B 4. it makes the following statement:

"Economic Order Quantity

"The economic order quantity is a function of (1) the cost to order and (2) the cost to hold....In computing economic order quantities for reparable items, the rate of demand from external supply sources rather than total demand (maintenance replacements) shall be used."

Existing DoD policy for the establishment of operating level depth for secondary items during provisioning is general and is contained in DoD Instruction 3232.4, April 2, 1956, subject: "Policy and Principles Governing Provisioning of End Items of Material". This Instruction states that "Initial spares and repair parts....requirements normally will be established for that period of time that extends from delivery of the end item of material until sufficient usage experience has been accumulated to permit determination of requirements by a Military Supply System." This period has been called, in various service implementing directives, a "usage data development period" or an "initial support period" and is generally synonymous with initial operating level. This Instruction does not distinguish between reparable and consumable items. It, therefore, does not indicate any difference

in the factors to be considered, or the techniques to be employed, in computing operating levels for reparable versus consumable items during provisioning.

B. Problem Description.

1. Operating Level, Initial Provisioning.

Lacking definitive DoD policy for the establishment of operating levels for secondary items during provisioning, each service has determined the initial operating levels considered appropriate. These vary considerably among the services, between item managers within the services and, to some extent, between weapons systems supported by an ICP.

At one ICP visited, the operating level for consumables, laid in during provisioning, represented three months system stock based on the replacement factor and item population. This level was used for most management categories and was based on a local ICP decision. The same ICP lays in a twelve months operating level of consumables for sub-systems applicable to one or more weapon system. This is directed by higher authority in the service.

A second ICP visited within the same Military Department, provisions a twelve month operating level for all new consumable items introduced during provisioning.

A third ICP procures what is called an "economic order quantity" of six months supply for consumable items during provisioning, although the six months is a fixed figure and factors normally associated with economic order quantities are not used.

Another ICP visited uses the forecast annual dollar demand to arrive at a consumable item operating level quantity. This ICP lays in either a three, six or fourteen month level, reducing the level as the forecast demand value increases.

Two ICPs visited were not concerned with initial provisioning decisions, although one was accepting initial supply support requests from the services as a result of their provisioning determinations. As required by applicable directives, these forms contain the services' estimates of the item quantities expected to be used in one year. These requirements are placed into the inventory record as a "program requirement", in the form of numeric stockage objectives, until demand experience takes over. One half of the requirement is considered an operating level during this period and the remainder a procurement lead time level.

Four ICPs concerned with establishing initial levels for reparable items were visited. Four methods for establishing initial operating levels were used.

At one ICP, a six month operating level was established based on anticipated issue (maintenance replacement) rates. This level, however, has the effect of representing an aggregate of an operating level and repair cycle level, with the major portion of the assets subsequently required to fill the repair cycle. Although no condemnation rate was considered in establishing the level, assets above those required to fill the repair cycle would, in effect, be used to supply replacements for condemned unserviceable items. Recent direction from higher authority, which had not yet been implemented, reduced this level to three months.

Another ICP based system operating levels for new reparable items introduced during provisioning on the Wilson EOQ formula using the projected annual dollar value of condemnations as an input factor.

Two other ICPs established separate operating levels and repair cycle levels for reparable items in the provisioning process. One established operating levels, based on issue (maintenance replacement) rates, of two months for "mandatory time change" items and four months for other reparables.

The other ICP established designated "stock levels" for reparable items during provisioning. These levels, however, are apportioned between depots and bases (using units) based on the anticipated repair rate for each and, therefore, cannot readily be equated with system operating levels established by other ICPs. In addition, this ICP generally ignored potential attrition rates during the establishment of provisioned levels and established no lead time or safety level, per se, for reparable items. Therefore, the "stock levels" established represent an operating level, a lead time level where subsequent condemnation is experienced and, in effect, a safety level to cover fluctuations in repair cycle times, repair rates, attrition rates, and lead times. In addition, where overhaul of the next higher assembly was planned, a thirty day stock level was established at repair depots based on the anticipated overhaul program and an assigned rate of component wearout during these overhauls.

2. Operating Level, Replenishment Requirements.

With respect to consumable items, the ICPs visited were fairly unanimous in their use of the fundamentals of the EOQ principle expressed in DoD Instruction 4140.11 and applied variations of the three factors: (1) annual value of demand; (2) cost to order; and (3) cost to hold.

Another element of commonality was the imposition of "ceilings" on economic order quantities to insure that procurements did not exceed a fixed, usually arbitrary, limit based on considerations which vary from ICP to ICP. The ceilings varied from 2 years to 5 years. "Floors" (minimum size of buy) were also applied, ranging from 3 months to 5 months. Most ICPs used a 3-month floor.

The greatest fluctuation was noted in the factors of cost to order and cost to hold. These ranged from one ICP using a cost to order of \$25, a storage cost of 1% per year, an interest cost of 4% per year and an obsolescence risk cost of either 5% or 33%, to another ICP using a cost of \$368 to procure under formal advertising and \$116 on a no-advertised basis, with a 15% cost to store. Another ICP used a procurement cost of \$30, and 5% as the cost to hold.

The biggest problem noted in the operating level area was the lack of definite policy and extreme variation in practice regarding the application of the EOQ principle in determining operating levels for repairable items. Some ICPs use the same formula for machine computation of the operating level for both consumable and repairable items, while some have separate machine formulas for repairables and consumables.

The mechanics of application of EOQ techniques differ considerably among the ICPs. Two ICPs have relatively complex computer programs for the determination of the economic operating level/order quantity. One such program incorporated tests for price breaks to take advantage of the most economic order quantity and varied the operational level to accommodate the economic quantity thus determined. Other ICPs have worked out tables which consider the basic

factors of the EOQ theory and use a manual table reference to determine the proper quantity. The tables in use are based on varied interpretations of the current guidance. One difference was seen in the use of dollar-value-of-annual-demand factor at most ICPs in contrast to one ICP which uses unit cost to determine EOQs within the low demand segment of its inventory.

C. Conclusions.

1. Initial Provisioning.

There is no definitive DoD policy governing the establishment of operating levels for secondary items during provisioning of new equipments/weapons systems. Lacking definitive policy each service or ICP has established its own. A relatively limited ICP review indicates that operating levels for new items established during provisioning differ extensively within the DoD, not only for unlike weapons systems but also for similar equipments/weapons systems. Of particular note is the frequent use of fixed operating levels for all consumable items provisioned by an ICP, or for all consumable items provisioned in support of a particular equipment/weapon system. If variable operating level guidance, within DoD Instruction 4140.11, has merit for replenishment requirement decisions, applicability of such guidance to provisioning requirement decisions should be explored and made clear. It is considered that a detailed functional review of this area could lead to identification of valid differences in establishing operating levels during initial provisioning and development of more definitive policy parameters in this area.

2. Observations regarding the application of current EOQ policy to operating level determination.

The formula for the computation of the economic order quantity included in DoD Instruction 4140.11, was considered a rather advanced step when it was published in 1958. A great amount of research has been made in the past seven years leading to refined and new techniques now in use or planned by the services and DSA. In addition, the capability of computers has been advanced to a point to which it is now possible to deal with an almost unlimited volume of data in a degree of detail far beyond that possible in 1958. These two circumstances have opened avenues of improvement in the determination of economic order quantity which are being recognized in the development of next generation systems by the Departments and DSA, but which are not spoken to in existing policy guidance.

Some of these improvements, to name a few, are:

- a. Tests of price breaks to take advantage of the most economic order quantity and varying the operating level to accommodate the economic quantity thus determined.
- b. Determination of the economic advisability of multi-year or demand-type contracts.
- c. Application of weighting and smoothing techniques.
- d. Use of "control settings" to adjust computations to situations such as periods of limited funding, declining programs, etc., with a much higher degree of accuracy than arbitrarily imposed "ceilings".
- e. Use of the "control setting" technique and simulation methods to introduce possible situations and determine their effect on resultant reliability of support to the mission.

Development groups working on second generation systems are considering and incorporating these and other advanced ideas which go far beyond the policy guidance in effect today. To insure OSD acceptance of these developments as they are implemented, to provide guidance to those who are still in the process of system design, and to take full advantage of the economies of improved techniques and machine capability, OSD should, as soon as possible, revise its EOQ policy to update it to the current state of the art and should continuously revise the policy to keep it abreast of the state of the art.

3. EOQ Factors.

Clarification of the OSD policy regarding the factors involved in an EOQ computation is required. These factors are: (1) annual value of demand in dollars; (2) cost to order; and (3) cost to hold.

The annual value of the demand in dollars is discussed under the problem area entitled "Use Rate".

Some specific aspects of the remaining two factors which illustrate the problem are:

As indicated earlier, the cost to order varies from a high of \$368 at one ICP to a low of \$25 at another. According to current guidance, a minimum of five elements are to be included in the determination of the cost to order. These costs include expenditures in the functional areas of stock control, financial control, procurement, transportation, and contract administration. None of the ICPs visited has a single point for the collection of cost data from this number of functional areas and a cursory investigation revealed no future plans for a computerized system which would encompass this range of data collection. The wide variation of costs in use indicates the inability

of ICPs to arrive at a finite figure. At least one of the elements involved, contract placement and administration, including inspection and acceptance, may not be performed by the ICP involved so continued difficulty in this area is foreseen.

The cost to hold, composed of seven input elements, varied from 5% of the item cost to a possible maximum of 38% of the item cost. (The 38% cost to hold includes a maximum 33% obsolescence rate.) At the ICPs visited, it was determined that no more than three of the seven elements are being used by any one ICP. These are storage cost, interest cost, and obsolescence risk cost. Since the current DoD guidance states that the interest cost "for the purpose of this Instruction will be assumed to be 4%", and all ICPs appear to be using this cost, the other elements considered account for a range of from 1% to 34%. It appears that four cost-to-hold elements are disregarded because of an inability to do more than guess at the cost of care and preservation, cost to inventory, and the cost of applicable stock control and financial control. The difficulty in collecting these cost data is similar to the problem in ascertaining cost-to-order data.

It would appear that, as an expedient, standard costs could be used by all ICPs, except where specific and valid cost data justify individual ICP cost values. Studies should be made to provide a basis for different costs, for different ICPs, if possible, for it is apparent that some of the cost elements, such as obsolescence risk, are far from uniform.

4. Size of the Operating Level.

Observations at the ICPs visited lead to the conclusion that the imposition of arbitrary floors (minimum size of the level) and ceilings

(maximum size of the level) is a common practice. This practice reflects common sense judgments regarding weaknesses in the mathematical techniques used. In lieu of the computed EOQs, floors favor less frequent buys, and attendant workload reduction, while ceilings result in buys of quantities less than those computed in the interests of reduced risk of obsolescence and reduced fund expenditure on a given procurement. While future advances in EOQ mathematical techniques should lessen the need to rely on floors and ceilings, in the interim the requirement for and content of uniform DoD-wide policy in this area should be determined.

5. Repairable Item versus Non-Repairable Item Operating Levels.

The failure of DoD policy to clearly distinguish between repairable item and non-repairable item operating levels requires correction. This is equally true for initial operating levels established during provisioning and operating levels established subsequently based on usage and maintenance experience. As outlined earlier, DoD Instruction 4140.4 is applicable to replenishable items and makes no distinction between repairable and consumable items, while DoD Instruction 4140.20, although applicable only to base level, is specific in its requirement for the establishment of EOQ-type operating levels for repairable items. Distinctive policies should be provided for these two categories of items, specifying the input factors and the factor relationships which will produce proper operating levels for the two item types. As one specific example, the use of issue rates versus attrition rates in computing operating levels for repairable items warrants close scrutiny and clarifying policy guidance. In this connection, the purpose of a repairable item operating level (i.e., as a source for issues during

repair batching, a source of issue between manufacturers' replenishment shipments; etc.) should be examined as set forth in policy statements.

Such clarification and improvement in DoD-wide policy is particularly important in its potential corrective effect on reparable item levels established during provisioning. There is the possibility of achieving full utilization of consumable items, when initial requirements are overstated, through continuing issues after completion of a "usage data development period". However, the same flexibility does not exist in dealing with reparable items with low attrition rates.

SAFETY LEVELS

A. Existing DoD Policy.

A safety level of supply is described in DoD Instruction 5000.8 (Glossary) as being that "quantity of materiel, in addition to the operating level of supply, required to be on hand to permit continued operations in the event of minor interruption of normal replenishment or unpredictable fluctuations in issue demand."

The OSD policy statement on safety level from DoD Instruction 4140.4, September 3, 1954, subject: "Management of the Materiel Pipeline Including Levels of Supply" (which does not differentiate between repairable and non-repairable type items or between repetitive and nonrepetitive demand) follows:

"IV 4. The safety level of supply for each item or category of materiel for a distribution point will reflect the soundest possible consideration and evaluated combinations of the following:

"(a) The importance and essentiality of the item or category.

"(b) The missions of the supported units and activities.

"(c) The time necessary to order and receive resupply under emergency conditions.

"(d) Estimate of the reasonable extent of unpredictable demands."

The OSD policy statement on safety level from DoD Instruction 4140.11, June 24, 1958, subject: "Peacetime Operating and Safety Levels of Supply" (which applies "to all consumable items which are stocked on the basis of repetitive demand") follows:

"III B. Safety Level of Supply

"1. It is the policy of the Department of Defense that safety levels for repetitive demand, consumable type items will not be established

for all items for a fixed time period but will be maintained at the minimum level determined to be necessary by a military department for a particular item or category of items, under specific circumstances. The safety level calculated for central distribution points will normally include but need not be limited to the following factors:

- "a. Frequency of demands (both mean and variable),
- "b. Sizes of demands,
- "c. Reliability of resupply,
- "d. Mission of the supported units or activities, and
- "e. Military essentiality and criticality of the item.

"2. The safety level computed in accordance with the Instruction for local distribution points will include the same factors listed in paragraph 1 above, and will be based on anticipated replenishable demands at the local distribution point.

"3. Specific formulas for computing safety levels and values for the variables set forth in paragraph III B 1 above will be developed by each military service."

OSD policy on the establishment of safety levels for repairable items at individual posts, camps, stations, and bases is expressed in DoD Instruction 4140.20, August 26, 1963, subject: "Base Supply Levels of Repairable Type Items". This directive approves of safety levels for repairable type items that have or are expected to have "maintenance removals and replacements at individual bases of such a frequency and rate as to require the maintenance of stock levels at those bases to support the demand". In its expressed policy on base safety levels and in a sample computation attached

to the directive, DoD Instruction 4140.20 indicates variable safety levels to be applicable to reparable type items. However, the Instruction does not deal with system requirements.

Current DoD policy directives concerning provisioning, such as DoD Instruction 3232.4, April 2, 1956, subject: "Policy and Principles Governing Provisioning of End Items of Materiel", do not speak to factors or techniques for the determination of safety levels for new items entering a supply system through the provisioning process.

B. Problem Description.

The ICP visits of the working group, though limited, showed many dissimilar methods used for the establishment of safety levels both in the provisioning process and for day-to-day management, and for both reparable and consumable items. These methods ranged from a highly complex, variable safety level approach to a fixed 30 day safety level for all items. It was noted that item characteristics such as relatively constant versus erratic demand, low and high item cost and whether subject to repair or not were often the basis for the variance. This is illustrated by the following:

One ICP established a fixed safety level of one month for all new consumable type items introduced through the provisioning process. When the items migrate to management based on demand, the safety level becomes variable, based on the value of annual demands. Safety levels up to a six month maximum are established for items having an annual demand of less than \$2500 and either one or two month levels for items having an annual demand exceeding \$2500. The system provided a fixed two month safety level for all reparable items, for both those introduced through the provisioning process and established items. Levels were based on either anticipated maintenance removal rates or actual issues.

Another ICP established fixed two month safety levels for all new consumable items introduced through the provisioning process. For those items with numeric stockage objectives, safety levels remain fixed. For items migrating to demand-based management, a variable safety level is established at the time of migration. The variable safety levels established are based on weighted averages of recurring demand and the number of requisitions (movement), with reduced weight applied to older data. Repairable items are divided into two basic management categories, i.e., (a) those subject to return to system management for depot repair and (b) those which are either repaired or washed out at the field maintenance level. A two month fixed safety level is established for both categories introduced through the provisioning process. After migrating to demand-based management, safety levels for the latter category are established in the same manner as those for consumables, with demand reflecting wash-out at the field maintenance level. For the former category a variable safety level, as a function of attrition over procurement lead time, is developed to support the operating level and a safety level to support the repair cycle requirement is developed based on a probability distribution table. The total safety level is the sum of the two.

An ICP visited provided no safety level for new consumable items introduced through the provisioning process, with the exception of those in support of one major weapon system. In this case, the safety level is variable as a function of the replacement factor, procurement lead time, and the relative essentiality of the item. The maximum safety level is one half the procurement lead time for the most essential items and decreases,

in relationship to the procurement lead time, as the essentiality to the weapons system decreases. Those consumable items for which no safety level is established during provisioning are subject to a sophisticated variable safety level concept upon migration to demand-based management. This concept, which is also applicable to reparable items, is based on a probability computation which causes the safety level to vary directly with the demand rate and its deviation history and with the procurement lead time and its deviation history, and to vary inversely with unit price, holding cost and the size of the operating stock level.

Still another ICP employs 25% of the procurement lead time as a safety level for consumable items, both for new items during the provisioning process and established items managed on demand history. This ICP establishes no safety levels, per se, for reparable items either new or established items. The system, however, does provide "stock levels" at maintenance replacement rates, in addition to repair cycle levels. These "stock levels", therefore, provide not only operating levels and lead time levels, where attrition is discounted in initial provisioning, but, in effect, safety levels for possible fluctuation in repair cycle times, repair rates, attrition rates, and lead times.

One ICP classifies its items as those items either having or not having a range of sizes and as either being subject to mandatory issue requirements or nonmandatory issue requirements. These classifications provide the variable factors for establishment of replenishment requirement safety levels. This ICP is not engaged in provisioning. A 75 day safety level is carried for

items having a range of sizes and for which issues are mandatory. It establishes a 45 day safety level for items having mandatory issue but for which a range of sizes is not involved and for items having a range of sizes but for which issues are not mandatory. A 30 day level is used for items which have neither a range of sizes nor mandatory issue requirements. This approach in effect, involves a combination of variable levels based on demand predictability (size) and essentiality (mandatory/nonmandatory issue).

Another ICP was not directly involved in provisioning projects but was receiving supply support requests for new items from other ICPs as a result of their provisioning efforts. The supply support requests contain a one year estimate of consumption by the ICP requesting support. No safety level, per se, was established for these items. The quantity representing the estimate for one year's consumption was established as a program requirement, with 50% designated as a lead time level, and 50% as an operating level. In computing replenishment requirements, this ICP employed a fixed 30 day safety level. This ICP deviated from the variable safety level policy of its parent organization because of the peculiarities of its commodities and an opinion that increased funds would be required to adhere to the variable safety level concept.

C. Conclusions.

Equipments/weapons systems within the DoD are not being assured reasonably comparable continuity of maintenance support because of dissimilar safety level policies. In some cases, this dissimilarity appears applicable to equipments/weapons having about the same relative importance to the national

defense. This dissimilarity in safety levels can also be seen among troop-related items and other items not related to equipments.

DoD policy, as outlined in directives noted above, specified the concept of variable safety levels based on factors applicable to individual items or categories of items. Some of these factors are used and some are not. Those that are used are subject to varying interpretation and emphasis.

None of the systems reviewed apply all of the factors specified, nor in all instances does such application appear practicable. Some examples are:

1. The factor concerning the mission of the supported units was notably absent from consideration at any ICP visited and it appears that application of this factor is highly impractical, if not impossible. The relationship of a common item to the wide range of missions of many units supported appears to be beyond the ability of most ICPs to maintain within a cost range which would make the benefits attractive.

2. It was noted that none of the ICPs visited directly relates the two factors, requisition size and demand frequency, in safety level computation. In most instances, the same weight is placed on a requisition from a small user for a quantity of one as is placed on a requisition for a large quantity to support a repair facility. The small unit may requisition more frequently than the repair facility. The recording of frequency of demand and size of demand is simple, but determining how to combine the two to place greater or less emphasis on either the less frequent demand for large quantities or the more frequent demand for small quantities becomes very difficult. DoD policy should clarify the application of these two factors, used separately or in combination.

3. DoD policy directs consideration of about a half dozen item characteristics in determining safety levels. It should be recognized that some of these characteristics cannot be judged with much precision at the time of provisioning. Examples are frequency of demand and reliability of resupply. Estimations, at the time of provisioning, of other item characteristics, such as item cost and essentiality, are likely to be somewhat more accurate. It would appear that variable safety level policy should be revised to place greater reliance on the more dependable item characteristics and to defer emphasis on characteristics which cannot be judged with reasonable precision. In addition, because of some confusion which may have been introduced by the term "repetitive demands" in current directives, applicability of the variable safety level policy to provisioning requirement computations should be clarified.

4. There is need for OSD clarification of policy on the application of the variable safety level concept to repairable items. As indicated earlier, DoD Instruction 4140.4 makes no distinction between consumable and repairable items while DoD Instruction 4140.11 specifies applicability to consumable items. DoD Instruction 4140.20, although addressing levels for individual bases and not system requirements, can be inferred to demonstrate the applicability of variable safety levels to repairable items. Differences among the ICPs visited in their approach to safety levels for repairable items bear out the uncertainty of the situation and the need for policy.

Methods of establishing safety levels in the DoD should be reviewed in detail toward development of DoD policy to:

a. Clarify the derivation, collection, and application of factors for setting variable safety levels.

b. Clearly define the potential fluctuations which safety levels shall be designed to offset, both for base and system safety levels, and both for consumable and reparable items.

c. Provide guidance in the use of specific techniques and factors for establishment of safety levels to assure similar protection for support of equipments/weapon systems of similar importance and a relative equity among ICPs in the use of dollar resources devoted to safety levels.

PROCUREMENT LEAD TIME LEVELS

A. Existing DoD Policy.

DoD Instruction 4140.20, August 26, 1963, subject: "Base Supply Levels of Reparable Type Items", provides a concept that lead time levels (order and shipping time) shall cover the quantity of items required to be supplied from external sources over the lead time (order and shipping) period. This Instruction does not cover "system" (i.e., "depot" or "wholesale") lead time levels.

DoD Instruction 3232.4, April 2, 1956, subject: "Policy and Principles Governing Provisioning of End Items of Materiel", does not provide definitive policy for the determination of levels, such as procurement lead time levels, for new items entering military supply systems through the provisioning process. No DoD instructions specifically cover the determination of procurement lead time levels in computing replenishment requirements.

B. Problem Description.

Lacking definitive DoD-wide policy for establishment of lead time levels, each Service has developed its own ground rules.

For consumable items, all methods observed at ICFs were similar. Procurement lead time quantities were based on projected issues over the procurement lead time period.

For reparable items, two ICFs visited were establishing lead time levels based on projected issue (maintenance replacement) rates over the lead time period. At one of these ICFs, it was determined that recent policy guidance from higher authority requires determination of these levels based on the

attrition (condemnation) rate over the lead time period. This policy was in the process of being implemented.

Another ICP visited establishes no lead time level for reparable items during provisioning, assuming 100% recoverability, until maintenance experience is gained. After the experience is obtained, this ICP applied the attrition rate to the lead time period to compute the lead time quantity.

Still another ICP is authorized to compute lead time levels at attrition rates for the lead time plus three months minus the repair cycle. This authorization, however, is restricted to those reparable items for which an attrition rate is known and is greater than 5% of maintenance replacements. Since the attrition rate of new reparable items is not known, this policy in effect results in no lead time level being introduced in initial provisioning, thereby ignoring subsequent attrition.

In summary, for reparable items, methods fall in four distinct categories:

1. Ignoring subsequent attrition with no level computed (new items in provisioning);
2. Levels based on maintenance removal rates over the lead time period;
3. Levels based on attrition rates over the lead time period;
4. Levels based on attrition over the lead time period less the repair cycle time.

C. Conclusions.

It is apparent that, comparable to the guidance in DoD Instruction 4140.20 with regard to base supply levels, system procurement lead time

levels should reflect the quantity of items required to be supplied from external sources during the period required to obtain these items. Following this precept, it is also apparent that determining lead time levels for reparable items based on issue rates, without regard to regeneration of assets during the lead time period, results in an overstatement of requirements. Conversely, it is apparent that not considering attrition rates in the computation of requirements, where it is reasonably certain that there will be subsequent attrition, leads to an understatement of requirements.

All methods of determining procurement lead time levels should be reviewed in detail, and DoD policy should be developed to insure that these levels consist of the item quantities required to be supplied from external sources during the period required to obtain the items.

REPAIR CYCLE LEVELS

A. Existing DoD Policy

Existing DoD policy directives do not provide guidance for the establishment of repair cycle levels in computing provisioning requirements for repairable items.

DoD Instruction 4140.20, August 26, 1963, subject: "Base Supply Levels of Repairable Type Items," defines Repair Cycle Requirement as "the quantity of repairable type items required to fill the repair cycle" and further defines Base Repair Cycle Requirement as "a function of (1) the anticipated number of maintenance replacements that will be repaired locally; and (2) the base repair cycle time." This Instruction does not provide policy for the establishment of repair cycle levels within system (i.e., depot, wholesale) requirements

DoD Instruction 4140.24, September 10, 1964, subject: "Requirements Priority and Asset Application for Secondary Items," defines a repair cycle requirement as "the estimated number of serviceable assets ultimately recoverable from the number of unserviceable items required to be in the repair cycle, based on the maintenance replacement rate" In addition, this directive provides special, detailed instructions for computing repair cycle requirements, but this guidance is offered in connection with the item stratification process and is not clearly directed to the item procurement and repair requirement process.

B. Problem Description

Varying methods are used by Jol item managers to fill repair cycles for reparable items.

One ICP computes a six month operating level for new reparable items entering the supply system through the provisioning process. This level is based on anticipated maintenance replacements over the six month period. While designated as an operating level, this level, in effect, fills a fixed six month repair cycle, and provides an operating level to cover issues for the six month period for replacement of items determined not economically repairable (i.e., attrition). For established items, with a repair history, a variable repair cycle requirement is developed based on the repair rate, expressed in units per month, multiplied by repair cycle time, expressed in days, and divided by 30. The repair rate employed equals system issues supporting maintenance replacements, less depot attrition.

Another ICP observed computes repair cycle requirements for mandatory time change items during provisioning by considering the anticipated total flying hours over a period equal to the repair cycle time, dividing this by the forecast average hours between item removals. For other reparables whose replacement is based on condition only, the ICP employs a replacement factor representing the anticipated failure rate for each 300 flying hours (called a maintenance cycle); the anticipated total flying hours over a period equal to the repair cycle time are converted to 300 hour maintenance cycles and multiplied by the replacement factor to produce a repair cycle requirement.

Subsequent to provisioning for replenishment requirement studies, the repair cycle requirement is developed for either a fixed four or six month period, as applicable, immediately following the supply control study, based on forecast requirements over this period, less returns from repair and dues in from procurement.

At another ICP, no repair cycle requirement was used during the determination of provisioning requirements. Later, a repair cycle requirement was used for management of reparable items, but only as a requirement level for determining the need to initiate repair. No repair cycle requirement was employed in arriving at a reorder point for initiation of procurement actions.

At a fourth ICP, repair cycle requirements were developed for both the depot and base level during provisioning. The base requirement is predicated on the percentage of maintenance replacements for which base repair is projected over a fixed 10 day repair cycle time. The depot repair cycle requirement is predicated on the percentage of maintenance replacements for which depot repair will be required, over repair cycle times which vary based on item characteristics. For replenishment studies the same pattern is followed except that forecast condemnations during repair cycles are deducted from the repair cycle requirements.

C. Conclusion

There is no definitive DoI policy, either requiring the use of repair cycle levels in centralized management of reparable items or prescribing factors and techniques to be employed in their development.

The need for such policy should be examined in detail toward insuring more effective support of operating forces with minimum investment. Aspects of current practices which warrant particularly close examination are:

1. Potential understatement of requirements by not employing repair cycle levels.
2. Not developing repair cycle requirements but filling this need through the use of assets stocked for other requirement levels based on factors not related to repair cycles.
3. Combining repair cycle levels with other stock levels and computing requirements on common factors not pertinent to both.
4. Potential overstatement of requirements by computing repair cycle requirements on total maintenance replacement rates in lieu of composite replacement/recovery rates comparable to those presented in DoD Instruction 4140.24.

ADDITIVE STOCK LEVELS PROCURED IN PROVISIONING

A. Existing DoD Policy

DoD policy concerning the establishment of additive levels of stock (as defined below) during the provisioning of equipment/weapons systems is limited to the following general statements:

DoD Instruction 3232.4, April 2, 1956, subject: "Policy and Principles Governing Provisioning of End Items of Materiel," states that one of the principal objectives of provisioning is to "assure that initial spares and repair parts will be available at maintenance echelons when needed" (underlining added). This Instruction further states that "initial spares and repair parts . . . requirements normally will be established for that period of time that extends from delivery of the end item of materiel until sufficient usage experience has been accumulated to permit determination of requirements and assumption of support responsibility by a Military Supply System."

B. Problem Description

The foregoing DoD policy is in some cases interpreted literally in that support items must be available at maintenance echelons when needed and not that support items must be available to maintenance echelons when needed within a reasonable period of time. This often leads to wide distribution of relatively slow-moving items and initial procurement quantities in excess of those which can reasonably be expected to be used during "that period of time that extends from delivery of the end item of materiel until sufficient usage experience has been accumulated"

Additive levels, for the purpose of this problem description, are defined as those stock levels computed, procured and laid in as a result of the provisioning process which are in addition to system operating, safety, procurement lead time and, for reparable, repair cycle levels. These levels include initial issues to operating and field maintenance units, both ashore and afloat, and both overseas and in the continental U.S.; initial levels to fill transportation pipelines for both CONUS and overseas activities; initial levels for overhaul of both end items and/or components/assemblies of these items; prepositioned war reserve levels, whether so named or not; initial levels for overseas depots; initial levels for specialized repair facilities; initial levels for mobile kits and; initial levels of organizational maintenance items for accompanying end items.

Based on the limited ICP visits of the working group, the variables entering into the quantitative determination of these additive levels within the DoD are many and complex. Many factors contribute to these variations and complexities, including differences in operating and field maintenance unit organizations and missions; program elements; "confidence"/"protection" levels required; proximity of maintenance units to the next higher echelon of supply, both in peacetime and anticipated in combat; laying in war reserve assets for new items in initial provisioning, follow-on

provisioning or through normal replenishment; controlled restrictions on the distribution of slow-moving items; deployment plans; degrees of reliance on individual technicians by overriding computational formulas based on judgment; availability and relative sophistication of methods for establishing essentiality/criticality for items; number of supply echelons between the user and system stocks; degrees of confidence in timely repair capabilities of field units; applicable logistics guidance; use of anticipated average demand as opposed to mathematical probabilities of distribution, use of combat consumption rates for peacetime stocks; and the use of identical consumption rates for both peacetime and war reserve stocks.

At one ICP visited, these additive levels consisted of zero, two or three months stock for CONUS operating and field maintenance units, depending on the maintenance echelon authorized to install the item, plus four and one half months stock of prepositioned war reserve. For overseas units the additive levels consisted either of four or five months stock, depending on the maintenance echelon authorized to install the item, plus a five months level for prepositioned war reserve. In addition, five months stock of prepositioned war reserve was laid in for selected reserve units. Stringent restrictions were placed on the distribution of items projected as slow movers, with the authorized stock levels including only those items for which movement could be predicted within the authorized stock level period. Computations of war reserve requirements were based on the same projected usage rates as peacetime requirements. Initial range and

and depth of stocks provided to operating and field maintenance units were mandatory for a specific period until valid usage warranted changes.

Another ICP visited laid in from about five and one half to eleven months stock for overseas units and two and one half to three and one half months for CONUS units for all items. A portion of these levels are for filling transportation pipelines but are additive to system operating, procurement lead time, safety, and depot repair cycle levels. War reserve levels as such are not normally developed during initial provisioning but are computed during follow-on provisioning of later procurement increments of the same end item. However, a portion of the initial levels are computed at combat consumption rates which, in effect, constitutes war reserve. These combat consumption rates are established by doubling the program element (such as flying hours) upon which this portion of initial stock is computed. However, units receiving these initial levels are following stock retention rules based on peacetime use. Excesses generated by this apparent contradiction subsequently revert to prepositioned war reserve stock. Average demand projected over the authorized stock level periods is used in arriving at item depth. This is based on the projected replacement factor and item density. Individual judgment is used in some cases to distribute slow-moving items to a relatively wide range of units where, in the technician's opinion, the item is critical and wide deployment of the end item warrants overriding the small projected demand rate

within authorized stock level periods. This widespread distribution appeared to be under close control. Levels provided to operating and field maintenance units were not mandatory but subject to negotiation. Final acceptance rested with receiving units. In some cases this negotiation takes place after the provisioning decision, with any increases being provided, either from other additive levels, or system stocks. In addition, lack of adequate program data for one major weapon reviewed caused initial operating and field maintenance unit levels to be computed on a gross item density basis during initial provisioning, with the subsequent requirement for individual unit negotiated levels met by drawing down other authorized levels.

A third ICP's additive levels were computed in one manner for the majority of equipments and in another manner for one major weapons system. The provisioning of the bulk of equipments provided a twelve months stock to operating units. Policy in this case has been revised to provide a three months level for operating units and a three months level to the next higher maintenance echelons. This policy is expected to be fully implemented during 1966. Both levels, however, will be based on combat consumption rates wherever such rates can be ascertained, with operating units utilizing this initial level for both peacetime and combat use and the next higher maintenance echelon reserving the three month stock level as prepositioned war reserve. Additional peacetime operating levels will subsequently be established at these higher echelons based on usage. Initial levels issued to operating and maintenance units are mandatory until valid

usage history, which would warrant change, is obtained. Initial levels are based on predicted usage during the period for which stock is authorized. In addition, selected critical slow-moving items are provided. Controls are included to assure that slow-moving items are not repeated both in operating unit and the next higher maintenance echelon's stock levels.

Another set of rules governs additive levels procured in initial provisioning by this ICP for one major weapons system. A complex system for coding each item's relative importance to ultimate mission is used. Average anticipated demand is projected over a two month period for both the operating units and the next higher maintenance units based on item population, either used or supported. Based on the item's relative importance to mission and, to a lesser extent, on unit price and cube, a confidence or protection level is assigned. Probability distribution tables are then entered, using the projected demand and the desired protection level against stockout to arrive at the authorized quantity. Items considered relatively important to mission are authorized even though the table indicates a zero stock quantity. This method results in many slow-moving items being widely distributed and repeated at the next higher maintenance echelon. The agencies' justification for this wide distribution is the relative importance of this weapon system to the national defense and its mission.

Another ICP's additive levels established during provisioning were limited. Requirements for user and field maintenance levels

were not computed for individual units but were included on a gross basis in system stock requirement computations for subsequent apportionment. These levels were, however, subject to change by either negotiation with receiving commands or based on individual judgment resulting in distribution requirements which exceeded in some cases the quantities procured. Stringent rules had been issued for restricting the levels of new items procured through provisioning. However, these rules are qualified to permit individual judgment noted. Sufficient examples of wide distribution of high cost slow-moving items were observed to indicate that the use of this qualification by individual analysts is not isolated.

C. Conclusion

There is a wide divergence in the degree of support provided for new equipments/weapons systems in the DoD in the form of additive stock levels outside of normal supply system operating, lead time, safety and repair cycle levels. There are valid reasons for this divergence in many instances.

Additive levels represent a significant portion of investment in initial support for new equipments/weapons systems. In limited examples reviewed these levels represented from 10% to more than 50% of the provisioning investment.

Because of wide variations in the elements impinging on these levels and the factors used in their computations it is difficult to compare the support provided.

The wide divergence in initial support provided in additive levels in the provisioning process should be reviewed in detail toward:

1. Establishing a measurement method for comparison. One possible method is a wide statistical sampling of total quantities procured for these additive levels considering the projected usage rate factor and total density to arrive at a "months of supply" figure. There are, however, pitfalls in this comparison method. Its application to reparable items is limited where the "buy" quantity can be more influenced by repair capabilities than usage rates. Even when used for consumable items care must be exercised to compare items relatively equivalent in price and end item quantities and deployment.

2. Identification of valid differences in degrees of support provided in additive levels.

3. Recommendation of more specific DoD policy which will establish parameters for these additive levels, recognizing the valid differences identified.

CRITERIA FOR MIGRATING PROVISIONED ITEM ASSETS TO DEMAND MANAGEMENT

A. Existing DoD Policy

DoD Instruction 3232.4, April 2, 1956, subject: "Policy and Principles Governing Provisioning of End Items of Materiel," provides that "initial spares and repair parts . . . requirements will be established for that period of time that extends from delivery of the end item of materiel until sufficient usage experience has been accumulated to permit determination of requirements and assumption of support responsibility by a Military Supply System."

DoD Instruction 4140.24, September 10, 1964, subject: "Requirements Priority and Asset Application for Secondary Items," makes reference to "provisioning items" as being those new items "for which sufficient experience has not been obtained to manage on the basis of normal demand forecasts" but provides no policy for transition from this category to normal reparable or nonreparable management categories.

B. Problem Description

The depth of new items, other than insurance items, entering supply systems through the provisioning process is related to projected usage over a specific period of time. The period of time established is designated by various names (e.g., initial support period, usage data development period). There are numerous reasons for usage developing more or less rapidly than forecast at the time of provisioning. Each Service therefore has developed procedures for coding new provisioned items in inventory records either to

permit management on a demand basis prior to the end of the period for which stocks were originally procured or to prevent premature stratification of items to long supply strata where usage experience has not been generated as early as projected. The length of time established for these control periods and the methods for measuring them vary considerably.

At one ICP visited, inventory management mechanized procedures in this regard are limited to the assignment of an additional "special study code" to provisioned items for which no demand is experienced for two years after the delivery of the last item. If no demand is experienced for one year after this assignment, the mechanized procedure automatically transfers the item to an inactive file. At any time during this three year period it is the prerogative of the responsible stock item analyst to decide when there has been reasonably representative usage to warrant management of the item on an experienced demand basis.

At another ICP new items are entered in a provisioning field in the inventory record and remain protected from stratification to long supply in this field for one year. This period starts when the applicable end items go into service. Items automatically migrate to demand management earlier if the reorder point is reached prior to the end of this year. Other means are used to prevent the transfer or disposal of assets of items which have automatically migrated to a demand basis, when special circumstances warrant such action by item analysts or higher authority. One example is the case in which

the operational use of the end item has not progressed as anticipated with the full potential for demand generation. New machine procedures are currently being programmed to provide print-out reports for provisioned items whenever (a) the reorder point is reached prior to the end of the year and (b) item quantities remain in operating levels at the end of the year's usage development period.

At another ICP visited, items are coded as provisioned items in the inventory record and the mechanized program automatically migrates the item to an appropriate demand-based management category when the reorder point is reached. If no reorder point is reached in two years, the item automatically migrates to either the category for slow-moving or insurance items, depending on the amount of demand experienced. Peacetime and mobilization objectives are established at that time and assets beyond these objectives are subject to stratification to long supply. The two year measurement period starts at the point in time the FSN for the new item enters the master inventory record.

At still another ICP visited, provisioned items are coded as new items in the master inventory record. Issues over the intended support period are projected and entered into the record. These projected issues are offset by the provisioning buy quantity. When actual issues exceed projected issues the new item code is dropped and the item reverts to demand-based management. If the new item code has not been dropped, based on issues, at the end of two years, the item automatically migrates to demand-based management and is

subject to long supply stratification. The new item code in this case is retained, however, to insure intensive review prior to any excessing action. The two year period is measured from the time the item enters the master inventory record.

At one ICP visited, which receives requirements for new items from Services engaged in provisioning, the Service-anticipated yearly consumption quantity is entered in the inventory record as a numeric stockage objective. One half of the quantity is entered as an operating level above the reorder point and the other half as a procurement lead time level below the reorder point. When the reorder point is breached or when, in the opinion of the item analyst, sufficient usage has been experienced, the item reverts to demand-based management. Items with zero demands after twenty-one months in the inventory record are referred back to the initiating service for requirement validation or deletion approval.

C. Conclusion

There is no definitive DoD policy for making the transition to manage previously provisioned items on the basis of subsequent experience data, in lieu of continuing to regard as bona fide the originally computed requirements based on provisioning factors.

Limited review of methods used for managing these items indicates the need for a detailed review toward development of DoD-wide policy in this area. During this review and subsequent recommendation of policy, particular attention should be given to:

1. Insuring that any necessary "protection" period for new items in support of new equipments/weapons systems is actually measured from a point in time when the potential for demand exists.

2. Establishing optimum periods for such protection to insure that such assets revert to management based on actual usage as early as practicable and are not held on a static basis beyond that necessary to insure a full potential for development of usage experience.

3. Recognizing the basic differences in the handling of new repairable items vice consumable items during a usage development period and providing definitive practices for each.

SELECTION OF ITEMS FOR MOBILIZATION RESERVES

A. Existing DoD Policy

DoD Directive 3005.5, June 10, 1960, subject: "Criteria for Selection of Mobilization Reserve Items," prescribes the following objectives, policies and criteria:

"OBJECTIVE

The objective of this Directive is to establish policies and criteria that will relate the selection of items to operational effectiveness under combat conditions. Judgment will be exercised to determine how long the using activities can be without the particular item before an unacceptable reduction in operational effectiveness takes place.

"POLICIES

A. Items to be selected as mobilization reserves will be based on the following specific criteria within the objective contained in paragraph III above:

1. Items which would be required for the survival of personnel.
2. Items essential for the operational effectiveness of combat forces.
3. Items essential for the operational effectiveness of the logistics system in support of combat forces.
4. Items, the lack of which would render inoperative or seriously impair the operational effectiveness of an essential equipment or weapon system.

B. Items will not be selected as mobilization reserves based on the following criteria:

1. Items solely for comfort, convenience or morale.
2. Items not currently stocked which would be obtained through the provisioning process after the assumed M-day against which requirements planning is being accomplished.
3. Items which are or will become non-standard, within the approved planning period except when the end item supported can be used as an acceptable substitute for a standard item which will not be available.
4. Items which can be readily fabricated in the field with the tools and bulk material normally available.
5. Substance items, except for operational rations.
6. Items normally available from commercial sources in sufficient quantities to meet war reserve military demands. Exceptions will be permitted when military considerations indicate that commercial type items must be prepositioned prior to the assumed M-day.
7. Items which have a short shelf life. Certain short shelf life items can be selected where overriding military effectiveness considerations prevail."

B. Problem Description

Notwithstanding the objective in DoD Directive 3005.5 to establish definitive policies and criteria for the selection of combat essential

items, interpretation of its provisions varies widely among the Services. In certain instances, selection of items reflects due consideration of combat essentiality, procurement leadtime and pertinent factors. However, the selection process for other items does not appear to be based on the policies and criteria stated in the DoD Directive.

Further, widely divergent interpretations among the Services of policies and criteria in DoD Directive 3005.5, and the changes that occur from year to year in the selection of items by each Service, have resulted in significant supply imbalances within inventories controlled by single managers who have no prerogatives in the selection of items. These conditions reduce the effectiveness of mobilization reserve planning. In addition, the large fluctuations in acquisition and retention objectives that are caused by frequent changes in item selection contribute to the reluctance of budget authorities to fund mobilization reserves.

A brief survey of policies and practices for item selection at ICPs has revealed specific problems. For example, at one ICP, published policies and criteria are identical to those in the DoD Directive. Further, the ICP is required to furnish a Service-approved combat essential items list to overseas commands responsible for choosing particular items for prepositioned stockage based on the range of items contained in the list. However, it became apparent that a list of items appropriate for mobilization reserve stockage had not been forwarded to any overseas command recently;

the last coordination of item selection between a command and the ICP occurred in March 1964 based on the information provided by the command.

In an audit report dated March 4, 1964, concerning one overseas command, impropriety in the item selection criteria and significant divergence from policy and criteria in the DoD Directive are emphasized. In that report, it is stated that mobilization reserve requirements for many items are determined by doubling the normal peacetime demand rate without any prior analysis for combat essentiality. Stockage under the criteria employed in this command, the report states, could result in a large build-up of excess inventories due to technological change and other factors, and thereby impair material readiness and the ability to support the procurement budget for necessary funds.

At a second ICP, where selection is limited principally to nonprepositioned stocks, the provisions of DoD Directive 3005.5 are recognized. However, in practice, ICP selection of items for the nonprepositioned mobilization reserves is not accomplished on an item-by-item basis. Rather, entire Federal Supply Classes estimated to be of "negligible military essentiality" are eliminated from consideration. It was agreed at the ICP that this practice results in some inappropriate item selections.

At a third and fourth ICP, responsible for the computation of requirements for items selected by the Services but having no prerogatives regarding selection, divergent interpretation and practices relevant to DoD Directive 3005.5 were cited as basic

causes for significant stock imbalances. For example, review of a list of 292 items at the third ICP, a Defense Supply Center, provided the following information:

Items Selected By:	Number of Items Selected For	
	PT Stocks	Mob Reserves
Three or four services	184	0
Two services	108	28
One service	0	264
Total	292	292

Whereas 184 items (63%) of the total sample were selected for peacetime stockage by most services and all 292 items are used by at least two services, 264 (90%) were selected for mobilization reserve by only one service. Of that number 213 or 81% were selected by the same service. Although the special requirements of each service will account for some differences in the selection of items, it is apparent from these data that there are wide variations in interpretation of the policies and criteria stated in the DoD Directive 3005.5.

The Progressive Refinement Integrated Supply Management (PRISM) report, March 1968, cites similar inconsistencies in item selection and includes the following recommendation:

"The OSD should undertake immediately a revision of DoD Directive 3005.5, Criteria for Selection of Mobilization Reserve Items. In its revision of Directive 3005.5, OSD should lend specificity to the inclusion and exclusion criteria now provided

and in such terms as to preclude variations in interpretation which now plague the current requirements process and contribute to the suspect quality of current requirement computation results." The recommendation has been concurred in by the Services and DSA.

A related problem of prime importance mentioned at the third ICP concerns the shortage anticipated of certain items that are urgently required to support short notice build-up of reserve forces. Since these items are not uniformly selected by all Services under the various interpretations of the criteria in DoD Directive 3005.5, past experience indicates that an inordinate drawdown of safety levels may be necessary to meet future emergency needs. Pending resolution of the problems, the ICP has recommended that a six month safety level be established and funded for the critical items required to support cold war requirements. In this connection, OSD is currently staffing a proposed revision of DoD Directive 3005.5 containing an added provision which is considered necessary to permit selection of the items concerned for the initial support of a sudden call-up of reserve forces to active duty.

At the fourth ICP, particular emphasis was placed on the imbalances that have resulted from changes made by each Service from year to year in selection of the same items. In certain instances, failure to include a previous year's selection and related requirements in the current year has caused large increases in excess stocks to appear in the stratification of inventories. Conversely, new selections

and pertinent requirements that did not appear in the previous year's stratification have caused undue fluctuations in acquisition objectives. Occasionally, such changes result from error but they are also attributable to differences in year-to-year interpretation by each Service of the criteria in DoD Directive 3005.5. The large variations in requirements data that result from instability in the matter of item selection impair the ICP's ability to support the procurement budget.

At a fifth ICP, it was stated that the service headquarters provides guidance for item selection and that the major field commands, not the ICP, select items (with the exception of items being provisioned) for mobilization reserve. The ICP advised that due consideration is given to combat essentiality; however, published guidance contains no reference to DoD Directive 3005.5 or specifically to the policies and criteria stated therein. In effect, the guidance states that it will remain the field commander's judgment as to what is needed.

C. Conclusions

There exist today widely divergent interpretations of the policies and criteria contained in the DoD Directive for the selection of mobilization reserve items. These inconsistencies have resulted in significant supply imbalances that are particularly apparent at single manager ICPs. In addition, the interpretation of the DoD Directive varies within individual services from year to year resulting in undue fluctuations in requirements data. These conditions sustain a position of no confidence on the part of budget authorities in the soundness of requirements. The result is a refusal to provide funds

which may be required to improve materiel readiness. It is generally agreed that a more definitive statement of policies and criteria is needed for the selection of mobilization reserve items. Follow-up work should be undertaken to assure appropriate implementation of the revised directive.

MOBILIZATION REQUIREMENT FACTORS AND COMPUTATION TECHNIQUES

A. Existing DoD Policy

In DoD Instruction 4140.16, August 4, 1961, subject: "Policies for the Management of Selected Mobilization Reserve Items," reference is made to "traditional detailed methods of requirements computation" for the purpose of establishing mobilization reserve stocks. That directive offers, as an optional course, the noncomputation of mobilization requirements for selected items and the meeting of mobilization needs through the combination of so-called emergency levels of supply (a six-month level) and large average operating levels resulting from economic order quantities of two years or more. These levels are in addition to the conventional procurement lead time assets. However, neither this Instruction nor other DoD directives reviewed provide specific guidance concerning factors and techniques to be used for mobilization requirement computations.

B. Problem Description

A review of mobilization requirement computation methods at ICPs indicated considerable difference in concept. To illustrate, at one ICP, the estimated recurring peacetime demand rates for stock fund items are multiplied by combat increase factors in the process of computing gross mobilization requirements. The increase factors used, however, do not take into consideration the pertinent characteristics and expected mortality under combat conditions of the individual secondary items involved. Peacetime demand rates are doubled in estimating wartime demand rates of parts applicable to

preferred (most modern) end items. Demand rates are tripled in the case of items supporting standard but nonpreferred equipments. Weighted averages of these two multipliers are employed when the densities of end items to be supported involve a mix of preferred and nonpreferred equipments. No forecast of wartime demand is made in the case of items applicable to obsolescent equipments planned to be phased out of use.

At a second ICP, the computation of the mobilization requirements is accomplished by applying anticipated secondary item combat consumption rates to end item densities indicated in mobilization plans. Each secondary item is considered separately in arriving at a combat usage rate, with peacetime demand employed as a starting point for the development of individual item factors. Ultimate approval of these rates rests with the field commanders responsible for combat operations.

At a third ICP, in computing general mobilization reserve requirements "size factors" and a "tempo factor" are applied to the peacetime demand rate for each item. The size factors reflect the increases, comparing peacetime to mobilization, in the various force sizes to be supported. The tempo factor, a multiplier of 1.4 times peacetime demand rates, represents increased wear-out under combat conditions. The size and tempo factors are identical for all items, except that the tempo factor is not applicable to items in any Federal Supply Class (FSC) when the class as a whole is considered not susceptible to increased maintenance under combat conditions. Other than the foregoing FSC exception, there is no consideration given to the

special characteristics of individual items in the development or the application of these factors

C. Conclusions

Our findings in this area indicate that, among the ICPs visited, there is little comparability in concepts, factors or techniques in computing mobilization requirements. The differences cannot be attributed solely to differences among the Services in mission, types of end items or equipments used, etc. For example, in all of the Services there are standard, nonpreferred equipments in use and preferred equipments in use or planned. The use by one ICP of blanket peacetime demand rate multipliers, based on equipment type classification, and nonuse of this technique by another ICP (also supporting type-classified equipment) creates a question about lack of comparability. An even more basic question concerns the lack of DoD-wide guidance in this area.

It seems evident from our discussions in the field that the quality of mobilization requirement computation work is influenced by several chronic difficulties. These include: the inherent uncertainty in mobilization requirement predictions; the workload involved in tailoring mobilization requirements to a large number of individual items, considering physical characteristics, end item utilization, etc.; and the little funding support given to mobilization requirement procurement, discouraging more intense computational efforts.

Despite the complexity evident in the area of mobilization requirement factors and computation techniques, the readiness and cost implications and the lack of DoD guidance urge early review attention and policy development.

APPLICATION OF OTHER THAN WAR RESERVE STOCKS IN THE COMPUTATION OF
MOBILIZATION RESERVE MATERIEL REQUIREMENTS

A. Existing DoD Policy

In DoD Instruction 4140.2, July 28, 1954, subject: "Management of Mobilization Reserve Stocks," it is stated that "Mobilization Reserve Stock will be retained . . . only to meet a Mobilization Reserve Materiel Requirement (MRMR) determined and established in accordance with JCS policies and plans and with the instructions for implementation of these policies and plans as promulgated in the DoD Directives System." In this connection, for certain principal items, DoD Directive 4200.1, February 11, 1959, subject: "Preparation of Materiel Planning Study, DD Form 764," considered obsolete but not cancelled, provides that Materiel Planning Studies, DD Form 764, will be prepared to reflect current and forecast materiel status, forecast of gross mobilization requirements, and a readiness analysis of net requirements and asset deficiencies. Specific instructions are provided for the application of assets on hand and on order to determine net materiel requirements. However, with regard to secondary items, no DoD directive exists containing specific policy or instructions for the application of assets to the Mobilization Materiel Requirement (MMR) or other gross mobilization requirement to determine the MRMR and related asset deficiencies.

B. Problem Description

In order to assure supply support of prescribed forces at combat rates, specific quantities of war reserves are needed in stock prior

to D-day. It is considered, however, that assets which will be available from other than war reserves should be deducted from gross mobilization requirements in the computation of quantities to be stocked as war reserve. Among the types of foreseeable assets which could be deducted are:

1. Normal peacetime pipeline assets assumed to be on hand on D-day or on order as a result of ordinary peacetime replenishment action taken prior to D-day. Quantities should be estimated for the following elements to the extent that the MMR (or equivalent) includes related requirements:

- a. Safety level assets
- b. Average operating level (operating level synonymous with procurement cycle or reorder cycle); usually one half of operating level
- c. Repair cycle assets
- d. In transit stocks
- e. Procurement leadtime assets (quantity is assumed to be on order at D-day from peacetime replenishment action, and phased as available for issue in specific intervals of time after D-day.)

2. Post D-day production (quantities expected to become available from orders placed on or after D-day).

In policy and practice, there is considerable variance among ICPs concerning the extent to which assets which will be available from other than war reserve stocks are applied to compute the mobilization reserve materiel requirement or that quantity of war reserves needed in stock prior to D-day.

To illustrate, at one ICP policy and stated practice is to apply assets on hand and on order substantially as mentioned above. Its approach to the determination of asset quantities which are estimated to be available from post D-day orders is based on the "P-Day Concept." P-day is defined as the point in time, expressed in number of months after D-day, at which the rate of production of an item equals or exceeds the rate of consumption from that point on.

At a second and third ICP, normal peacetime stocks assumed to be on hand on D-day and on order prior to D-day are applied. Concerning the estimate of asset quantities to be available from post D-day orders, the policy at the second ICP takes cognizance of the D- to P-day concept; however, the practice there is not to estimate these quantities for the majority of items nor to apply such data in the computation of net mobilization reserve requirements for any item. It was indicated that one reason for not reducing gross requirements by these quantities is that the administrative resources required to make and to periodically update such estimates would be largely wasted because mobilization requirements are rarely funded at that ICP.

The third ICP does not estimate post D-day production nor is there any policy or requirement for its accomplishment.

At a fourth ICP, the mobilization reserve requirement is considered to be satisfied for any item having a two-year procurement cycle under the EOQ principle or a safety level equal to or in excess of the mobilization requirement. For all remaining items, however, the safety and average operating levels (totalling approximately 75 days of supply) are not considered in computing net mobilization reserve requirements. At this ICP, policy and stated practice are to deduct estimated D- to P-day production in the computation of net requirements. However, production for all items has been assumed to begin from a "cold base" (that is, no production in being on D-day). In an analysis of mobilization reserve requirements at that ICP for 16 items determined to be in continuous or almost continuous peacetime production, the ICP estimated that a reduction of approximately \$22 million or 42% could probably be effected by abandoning the "cold base" concept for those items.

A fifth ICP does not deduct peacetime assets on hand in the computation of net mobilization reserves; however, post D-day orders with deliveries prior to P-day are applied.

At a sixth ICP, policy and practice exclude the application of peacetime assets on hand and on order prior to D-day and post D-day orders in the computation of the Mobilization Reserve Materiel Requirement.

C. Conclusion

The divergent policies and practices in existence today among ICPs indicate that net requirements may be overstated because all assets are not considered. Lack of confidence in the soundness of war reserve requirements results in a virtual refusal on the part of budget authorities to fund them. This situation may be causing reduced materiel readiness but the degree of shortage would be difficult to ascertain due to the questionable net requirement (MRRR) computations involved. There is a clear need for definitive policy to correct this condition.

BASIS FOR DECISIONS REGARDING PREPOSITIONED MOBILIZATION RESERVE

MATERIEL REQUIREMENTS

A. Existing DoD Policy

In DoD Directive 4140.1, October 12, 1956, subject: "Inventory Management Policies," general criteria for positioning mobilization reserve stocks are stated in Paragraph IV B:

"The military services shall store mobilization reserve stocks in that manner and at such locations as to most properly support approved mobilization and emergency war plans, and shall so position stocks in such a manner as to attain minimum vulnerability."

DoD Directive 4140.2, July 28, 1954, subject: "Management of Mobilization Reserve Stocks," Paragraph III 2, provides that:

"Mobilization Reserve Stock will be retained, stored and maintained only to meet a Mobilization Reserve Materiel Requirement (MRMR) determined and established in accordance with JCS policies and plans and with the Instructions for implementation of these policies and plans, as promulgated in the DoD Directives System"

Whereas Joint Logistics and Personnel Policy and Guidance (JCS Pub 3), September 1964 (Confidential), Section XVII, prescribes uniform guidance in some detail for consideration and development of requirements for prepositioned materiel, such criteria have not been promulgated in the DoD Directive System.

In DoD Directive 4140.21, November 15, 1963, subject: "Management of Mobilization Reserve Stocks of Items Assigned to the Defense Supply Agency," the prepositioned war reserve requirement (PWRR) is defined as follows:

"That portion of the mobilization reserve materiel objective (MRMO) which strategic plans dictate be positioned prior to hostilities at or near the point of planned use or issue to the user, to insure timely support of a specific project or designated force during the initial phase of war, pending arrival of replenishment shipments."

B. Problem Description

Current practice indicates considerable differences among the Services in concept for the designation and management of prepositioned war reserves. These differences are reflected in a comparison of the magnitude of the prepositioned war reserve requirement (PWRR) in relation to total requirements for mobilization reserves at various ICPs. To illustrate, at one ICP, the PWRR was approximately 79% of the acquisition objective (excluding operating unit PWRR). It was estimated that over 90% of the prepositioned war reserve requirement is for stockage in CONUS Depots.

At a second ICP, the worldwide PWRR was stated to be only 26% of the acquisition objective and 37% of that requirement is for stocks prepositioned in CONUS Depots.

At a third ICP, it was determined that the total acquisition objective is considered a prepositioned war reserve requirement. Eighty-three percent (83%) of the requirement is for stockage in CONUS Depots.

The differences mentioned above are attributable, in part, to the differing missions of the respective services. However, significant variations are also ascribed to the lack of essential DoD policy and criteria, concerning the portion of the total mobilization

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reserve requirement which must be treated as a prepositioned war reserve requirement, resulting in unilateral and to some extent arbitrary decisions by the Military Departments.

C. Conclusion

The decision to treat some portion or all of the mobilization reserve requirements of a particular service or ICP as prepositioned carries with it certain implications, advantages and disadvantages. The principal implication is that, in the event of war, the requirement probably or certainly could not be satisfied without having the materiel on hand, reserved and continuously available, at the location designated, and in the physical state of pack specified. The advantage, of course, is high responsiveness to need, should it arise. The disadvantages include (1) the need to specially care for this prepositioned materiel (holding and rotation tasks, special accounting in some cases, etc.) and (2) the inability, due to the decision to preposition, to rely on other asset sources (such as regular peacetime on hand stocks, regular peacetime on order assets, higher level wholesale stocks such as DSAs, and assets which can be obtained via orders placed on or after D-day).

Without question, the disadvantages must be accepted if the materiel is required to support planned wartime actions and if prepositioning is the only practical means of achieving a high probability of its availability. However, the wide range in the proportion of PWRR to total war reserve requirements, scanning across the Services - from 29% to 100%, suggests that they have followed

dissimilar and possibly unrealistic criteria in reaching decisions to preposition war reserve stocks. This problem area should be examined in depth and specific and uniform DoD-wide criteria should be developed to guide prepositioning decisions.

BALANCING AND PROTECTING MOBILIZATION RESERVE STOCKS

A. Existing DoD Policy

No DoD directive prescribes policy or procedures for balancing mobilization reserve stocks (reducing the protectable wartime requirements of some items by using a part of the mobilization reserve stocks (MRS) to meet funded peacetime requirements and using the funds conserved to procure additional assets of other MRS items whose protectable level is increased appropriately.)

However, in DoD Directive 4140.24, September 10, 1964, subject: "Requirements Priority and Asset Application for Secondary Items," Paragraph VI. a. 2. c., cognizance is taken of the effect of balancing actions in the stratification of inventories.

B. Problem Description

In order to improve mobilization reserve inventory posture and protect the investment in these stocks, a concept for balancing has been prescribed by several services. In practice, there is considerable variation in the Service/Agency directives on this subject, and relatively minor or no balancing is accomplished at most ICPs. To illustrate, at one ICP balancing of mobilization reserves and the establishment of a record to account for funds conserved and re-invested had been directed by service headquarters. However, neither objective has been met because the ICP has construed service instructions to mean that balancing within its commodity area is neither mandatory nor feasible.

At a second ICP, service policy provides that mobilization reserves will be balanced; however, the ICP has advised that no balancing has been accomplished because peacetime funds have not been sufficient to permit it. Further, it was stated that, contrary to DoD policy, protectable mobilization reserve stocks (nonprepositioned) are being drawn down to satisfy peacetime requirements without replacement of the investment. This practice, too, was attributed to inadequate peacetime funding.

A third ICP implemented revised balancing procedures in August 1965. In order to facilitate the balancing process, mobilization reserve items were arranged in groups which were ranked in descending order based on military essentiality. Requirements for items in the lower priority groups will be reduced to release assets for peacetime needs and conserved funds invested in mobilization reserve stocks of higher military essentiality. The following data indicates improvements in protectable mobilization reserve inventory posture that the ICP expects to achieve from balancing:

Percentage of Protectable Mobilization
Reserve Stocks in Various Essentiality Groups

<u>Essentiality Group</u>	<u>Current %</u>	<u>Proposed %</u>
1	17.31	42.75
2	5.27	17.12
3	48.40	28.56
4	16.42	10.35
5	0.12	0.10
6	0.17	0.05
7	5.41	1.07
8	6.40	0.00
9	0.50	0.00
	<u>100.00</u>	<u>100.00</u>

At a fourth ICF, it was stated that balancing procedures have been implemented in accordance with Service policy. However, there were no records of the magnitude of peacetime funds conserved or the extent to which balancing was accomplished in successive fiscal years.

A fifth ICF advised that current procedures do not provide for balancing mobilization reserves through the conservation of peacetime funds. The ICF stated that it considered omission of such a program to be a management deficiency and that it would take action to initiate necessary instructions.

A sixth ICF stated that Service directives do not provide for balancing mobilization reserve stocks through the conservation of peacetime funds and that the concept is not applicable.

C. Conclusion

Whereas several services have directed implementation of procedures and DOD Directive 4140.24 gives cognizance to balancing transactions in the stratification process, relatively minor or no balancing has been accomplished at most DPs visited. In certain instances, failure to initiate procedures for balancing mobilization reserve stocks through the conservation of peacetime funds may have resulted in loss of opportunity to achieve an improved MRS readiness position within financial limitations. In view of the impairment to materiel readiness and economy of operations that could occur from failure to balance stocks, there is a definite need for DOD-wide policy and aggressive implementation to correct this condition.

REVIEW OF COMPUTED REQUIREMENTS

A. Existing DoD Policy.

DoD Instruction 4200.6, December 14, 1955, subject: "Materiel Program Control - Principal Items", defines principal items as "those end items of major importance which require detailed analysis and examination at the departmental level....of all factors affecting their supply and demand. An end item will be considered for selection as a principal item on the basis of relative combat or training essentiality and the following additional criteria:

1. High monetary value.
2. Difficulty of procurement or production.
3. Unduly short or excessive supply position.
4. Criticality of basic materials or components."

DoD Instruction 4200.1, February 11, 1959, subject: "Preparation of Materiel Planning Study, DD Form 764," defines the purpose of the directive in part as follows: "Provide a uniform presentation of requirements and asset data from which the Office of the Secretary of Defense and the Departments can discharge their responsibilities in the field of requirements and supply management, and can evaluate the effectiveness of policies, plans and programs and progress being made."

While the two directives quoted above are applicable to principal items only (there is no comparable directive for secondary items), they do express a need at OSD and Departmental levels for a standard format with standard data elements to permit the evaluation of the many factors involved in requirements computations.

F. Problem Description.

Every ICP visited displayed some form of directive which expressed policy regarding the procedures for the review of computed requirements of secondary items. Common among the directives was the establishment of several levels of review, and in each case the criteria for the determination of the review level was the dollar value of the procurement.

Another common technique was the "committee" approach to requirements reviews of high dollar procurements. Composition of the committees varied among the ICPs but the pattern indicated efforts to bring activities from outside the supply function into the review process.

While all of the ICP directives did not indicate in detail the elements of the computation selected for emphasis during reviews, it was noted that in almost every instance the "committee" approach placed particular emphasis on lead time, asset position, use of partially and fully interchangeable substitutes, assets available from repair, demand forecasting techniques, judgment decisions by the analyst and compliance with policy. One ICP described the process in three steps: (1) Review - check of the computation for compliance with policy; (2) Audit - a recomputation including verification of input data and the mathematics involved, and (3) Analysis - a search for gaps in logistics guidance. Another ICP had developed a "profile" form which presented a pictorial analysis of the item consumption for the past eight quarters and the forecast demand for the next six quarters. The form also indicated previous procurements, actual lead times, delivery increments, previous buy deferrals, etc., to give the review committee a detailed picture of the history and projected future of items having a procurement value in excess of \$100,000.

The greatest variance among the ICPs visited was noted in the value of procurements which receive no review or review by the lowest management level. One ICP authorizes the item manager to approve procurements of a value up to \$500 while another ICP permits lowest level approval up to \$10,000. Still another ICP requires no review of procurements of less than \$50 and authorizes branch level approval of those between \$50 and \$5,000. One ICP permits any procurement of a value less than \$2,500, for items not coded for manual review, to move directly to the procurement activities. For those coded for manual review but less than \$2,500, this ICP permits the individual item manager or other individual delegated by the division chief to approve.

The "floor" value of procurements subjected to the "committed" review method also varied. One ICP uses a procurement value of \$100,000 as the starting point for committee review. This same ICP required commander approval of all procurements over \$300,000 after the committee had approved them. Another ICP started committee review on procurements at \$5,000 while a third ICP employed a branch level committee for procurements from \$10,000 to \$100,000 and a division level committee for those over \$100,000. Another ICP used a committee review figure of \$100,000 for all of its supply classes except one, and that one became eligible for a committee review at \$50,000.

At the three ICPs having specific cutoffs for several regular levels of review, the following levels and values were specified:

<u>Level</u>	<u>Value</u>
1. Commodity management officer	Up to \$5,000
Section supervisor	\$5,000.01 to \$15,000
Branch supervisor.	\$15,000.01 to \$25,000
Division supervisor or his assistant	\$25,000.01 to \$100,000
Committee action	Over \$100,000
2. Item manager	Up to \$500
Unit chief	\$500.01 to \$1,500
Section chief.	\$1,500.01 to \$5,000
Branch chief	\$5,000.01 to \$15,000
Division chief	\$15,000.01 to \$50,000
Director of materiel	\$50,000.01 to \$150,000
Commander.	Over \$150,000
No internal committee action, but higher headquarters committee review of selected high value procurements.	
3. Individual manager or as delegated	Up to \$2,500
Section chief.	Up to \$10,000
Branch chief	Up to \$50,000
Division chief or his assistant.	Over \$50,000
Committee.	Over \$100,000

An incongruity of the "committee" approach noted by the group was that this type review is usually the most time-consuming review method and tends to extend procurement lead time by the amount of time added to achieve the committee action. Since committee action is in the high dollar value segment, it can be assumed that some increase in procurement lead time requirement results. The ICPs using this approach were, however, unanimous in their agreement that the procurement reductions resulting from committee review, together with the increased emphasis placed on accurate work prior to review, more than offset costs resulting from increased lead time.

C. Conclusions.

From the foregoing, two things become evident: (1) OSD recognizes the value of computed requirements review at its own level for a certain range of items and (2) inventory control points recognize the need for manual review

of computed requirements at several levels and in several degrees of skill and intensity. The value of the procurement is but one of five elements considered in the establishment of OSD criteria for review while the dollar value is almost the only consideration in determining the level and intensity of review by the ICPs.

Because of the vast number of manhours involved in ICP review of computed requirements and because of the vulnerability of budget justification without stringent requirements reviews, this subject requires analysis and a firm policy statement relative to secondary items. Developers of next generation systems indicate that with improved input data, application of mathematical methods of smoothing and trend forecasting, and with more frequent machine item computations, the ability to go directly from computer to procurement should be greatly improved. They are, however, reluctant, in the face of present policy silence, to establish rules which will permit manhour savings in the review effort for fear of jeopardizing the defense of their budgets. It would appear that one of the major benefits of improved computer application should be greater reliance on the computer product, and this degree of reliance should be stated in OSD policy.

BUDGETARY REQUIREMENTS

A. Existing DoD Policy

DoD Instruction 7110.1, August 9, 1965, subject: "Guidance for the Preparation of Budget Estimates, Budget Execution Programs and Apportionment Requests, and Related Support Material," establishes the subject guidance as a DoD issuance and assigns the responsibility for its publication, revision as necessary, and distribution to the Deputy Assistant Secretary of Defense (Budget), OASD(Comp).

The current issuance, dated August 6, 1965, is 7110-1-M, "Manual for Preparation of Budget Estimates, Budget Execution Programs and Apportionment Requests, and Related Support Material." This manual provides precise guidance for the mechanical preparation of budget estimates, budget execution programs and apportionment requests, and related support material. It specifies the forms, lines and columns in detail but is general and vague in its coverage of such matters as factors, computation methodology, levels, etc. As an example the following statement is quoted from the portion titled "Instructions and Preparation of Exhibit P-18, Spares, Repair Parts and Materiel Operating Budget":

"Inventory and on-order objectives at end of period. Enter in the current year and budget year columns the estimated value of inventory and on-order objectives for operating stocks as computed on the Exhibit P-18 b. The basis used in computing each element (e.g., safety level, production leadtime, review cycle, repair cycle, etc.) of the inventory objectives for operating stocks

should be provided in a narrative statement accompanying the P-18 b.

The basis used in computing the War Reserve inventory objective should also be explained in a narrative statement" (underlining added).

Another example from the same manual is the following guidance to the Navy:

"Budget Project 1925 - Supporting Programs. Each sub-activity will be supported by the shopping list, formula or other method used for computing the requirement . . ." (underlining added).

B. Problem Description

The following quotation from an OASD(I&L) memorandum summarizes a problem of long standing:

"Lack of Congressional confidence was evident during the hearings by the House Subcommittee on DoD appropriations. Criticisms cited at that time were that knowledge and control of assets were inadequate; requirements computation and materiel management techniques were faulty; and interservicing of assets and data were unsatisfactory."

The problem of the relationship of budget requirement computation and justification to item requirements computations and policy was highlighted during our discussion with one of the Service headquarters. It was said that criticism at any budget review level is helpful but is not acceptable guidance to support service changes in supply management policy. Another headquarters elaborated upon this theme when they pointed out the action being taken by them to correct

areas selected for intensive review and criticism at their most recent budget review but further stated that they have no assurance these areas will be emphasized during the next review of budgetary requirements.

A representative of the OSD budget office observed that budget reviews get into the business of reviewing supply management practices and attempt to correct bad practices by tightening the purse strings and offering suggestions.

It is evident that lack of DoD policy in most of the problem areas discussed in this Attachment, and many others, results in an inability to apply uniform review techniques at all budget review levels, that will make possible comparable reviews against prestated standards. Until DoD policy guidance is more definitive in those supply management areas upon which budget preparation is predicated, the Services and DSA will continue to face the possibility of unpredictable criticisms and fund reductions due to practices for which neither the budget submitters nor the reviewers have a basis for consistent action.

C. Conclusion

The conclusion regarding budget justification in relation to requirements computation can be none other than an amplification of the theme reflected in every problem area discussed in this attachment. DoD policy is required. The specific conclusion in this area is that as DoD policy is developed and announced, it must be made a particular reference in the budget guidance manual. This was done

in the most recent guidance which specifies Table I - Illustration of the Stratification Process, from DoD Instruction 4140.24 as a required exhibit for budget justification.

ATTACHMENT G

PROPOSED
DEPARTMENT OF DEFENSE DIRECTIVE

SUBJECT: Defense Supply Management Review Program

I. PURPOSE

This Directive establishes the Defense Supply Management Review Program.

II. APPLICABILITY

The provisions of this Directive apply to the Military Departments, the Defense Supply Agency (DSA), and other components of the Department of Defense.

III. CONCEPTS AND OBJECTIVES

The concepts and objectives of the Supply Management Review Program are:

- A. Examination of supply management policies and practices on a DoD-wide basis, to enable maximum comparison among DoD agencies and maximum opportunity for identifying and selecting the most effective and economical policies and practices.
- B. Establishment of relative priorities among the supply management areas to be reviewed, in order to selectively apply resources to the solution of those problems offering the greatest potential for gains in supply effectiveness and economy.
- C. Pronounced emphasis on review of DoD-wide policies and their effects, so that the review program will serve as an important input source for improved, more uniform supply policy throughout the Department of Defense.

- D. Maximum use of existing review resources, to minimize manpower investment and the review impact on supply management agencies.

IV. ORGANIZATION AND FUNCTIONS

A. Assistant Secretary of Defense (Installations and Logistics). A

staff shall be established to plan and direct the operations of the Supply Management Review Program and shall be responsible for the following functions:

1. Select the supply management problem areas to be incorporated in annual and longer range review programs, and establish topic priorities.
2. Advise the Military Departments, DSA, and other DoD agencies, as appropriate, of such review programs and objectives for developing uniform DoD-wide policies in specific supply management functional areas.
3. Arrange with other OSD organizations and with other DoD components, as appropriate, for their participation in the Supply Management Review Program.
4. Develop specific problem descriptions and review objectives.
5. Assist in the preparation of, or review, detailed guidance for the conduct of individual reviews to be made by participating organizations.
6. Directly undertake reviews of selected supply management areas where the urgency of ASD(I&L) interest or other special circumstances make the assignment of selected subjects to participating organizations infeasible.

7. Obtain and analyze reports and other required information from participating organizations.
8. In coordination with other OSD organizations involved, develop proposed DoD-wide policy guidance indicated to be needed by problem area reviews and, when appropriate, staff proposals with the Military Departments, DCA, and other agencies.

B. Assistant Secretary of Defense (Comptroller). ASD(Comp) shall be responsible for the following functions:

1. Make arrangements with ASD(I&L) concerning the extent of Supply Management Review Program participation by audit personnel throughout the Department of Defense; direct Military Department and DSA audit participation; and, when indicated by changes in workload or staffing, arrange for adjustment in audit participation.
2. Recommend to ASD(I&L) areas for supply management review.
3. Allocate designated audit resources to meet established review programs.
4. Develop audit guidance for each review topic in collaboration with ASD(I&L).
5. Assign to audit agencies individual or joint participation in particular reviews, as appropriate, and coordinate such audit efforts.
6. Obtain from participating audit agencies reports which offer findings, evaluations and, whenever possible, recommendations with respect to DoD supply management policy.

2. Provide to ASD(I&L), for each supply management area reviewed, a single report which offers findings, evaluations and, whenever possible, recommendations with respect to DoD supply management policy.

3. Military Departments and Defense Supply Agency. The Military Departments and DSA shall participate in the Supply Management Review Program, as follows:

1. Collaborate with ASD(Comp) in establishing arrangements for audit personnel of the Military Departments and DSA to assist in the Supply Management Review Program within existing resources; undertake such review work; and report results.
2. Establish and designate a point of contact and coordination within the supply management staff of each Military Department and DSA to be responsible for communication and collaboration with ASD(I&L) on such matters as problem area identification, selection and priorities; guidance for conduct of reviews; and participation in reviews, on a selected case basis, by Departmental and Agency supply management personnel.

4. EFFECTIVE DATE AND IMPLEMENTATION

This Directive is effective immediately. Three (3) copies of each implementing document shall be forwarded to the Assistant Secretary of Defense (Installations and Logistics) within sixty (60) days.